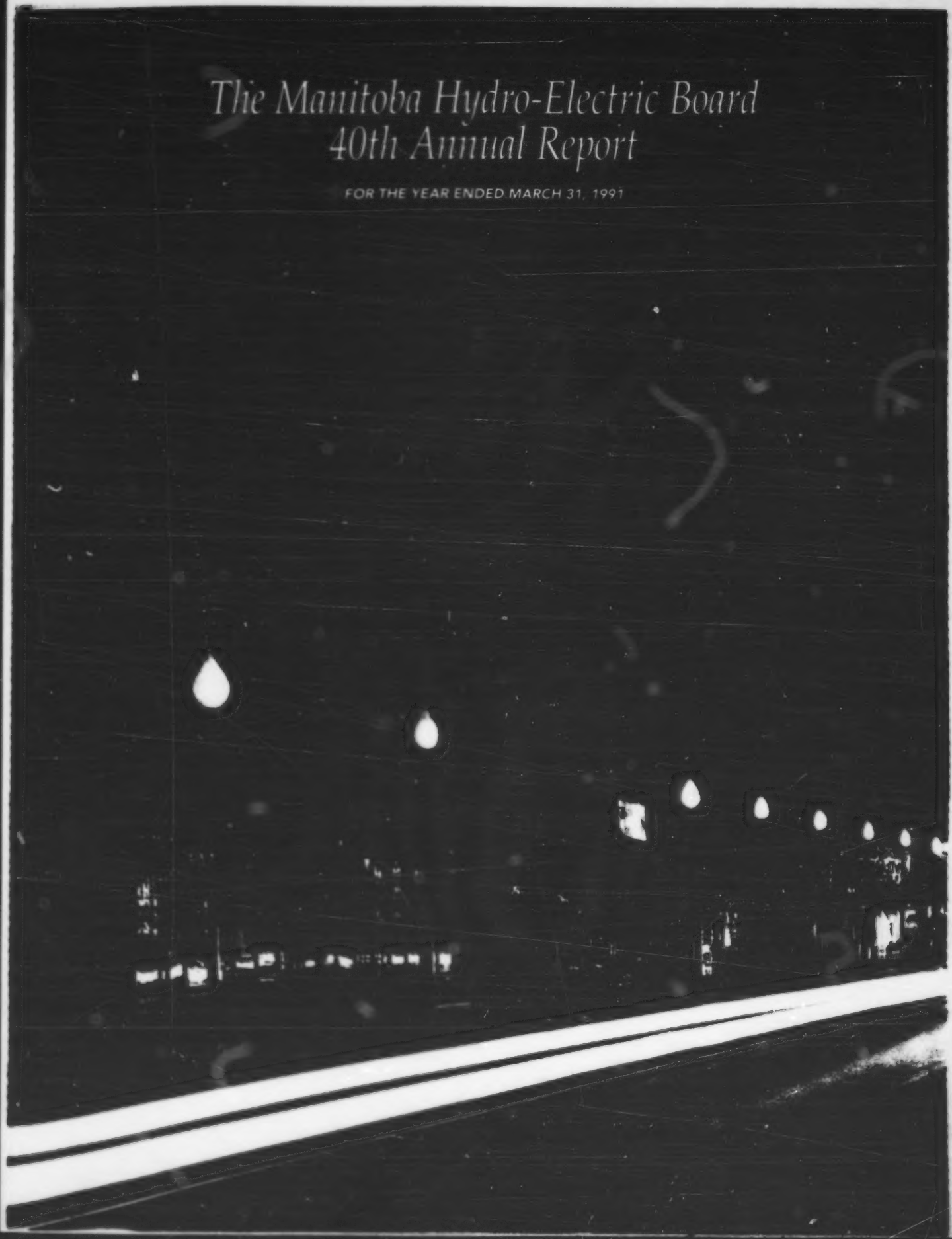
The Manitoba Hydro-Electric Board
40th Annual Report

FOR THE YEAR ENDED MARCH 31, 1991



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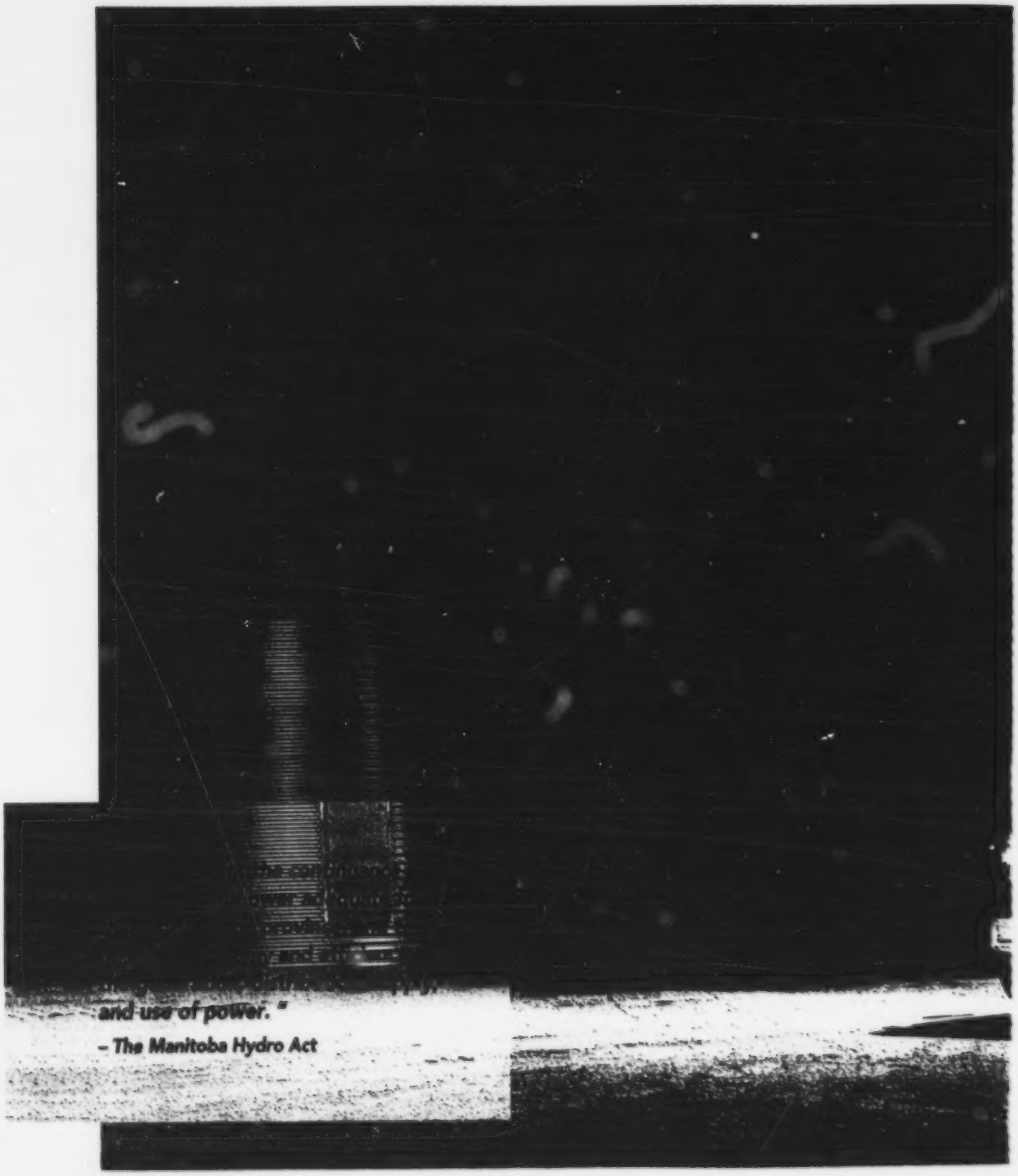
HIGHLIGHTS

FINANCIAL

Finance Expense

OTHER



and use of power."

– The Manitoba Hydro Act

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DUSK TO DAWN GLOW: For safety and security, high-pressure sodium (HPS) sentinel lighting eliminates dark spots and shadows in the farmyard from dusk to dawn. Over the next five years, Manitoba Hydro will be converting 17 000 incandescent and mercury vapor sentinel lights to HPS. Together with the conversion of approximately 63 000 streetlights to HPS, demand will be reduced by 11 000 kilowatts and energy by 42 million kilowatt hours per year.

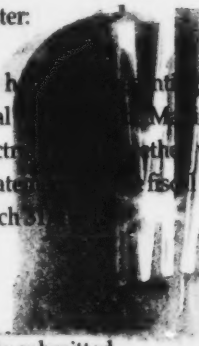
LETTER OF TRANSMITTAL

July 31, 1991

Legislative Building
Winnipeg, Manitoba
R3C 0V8

Dear Minister:

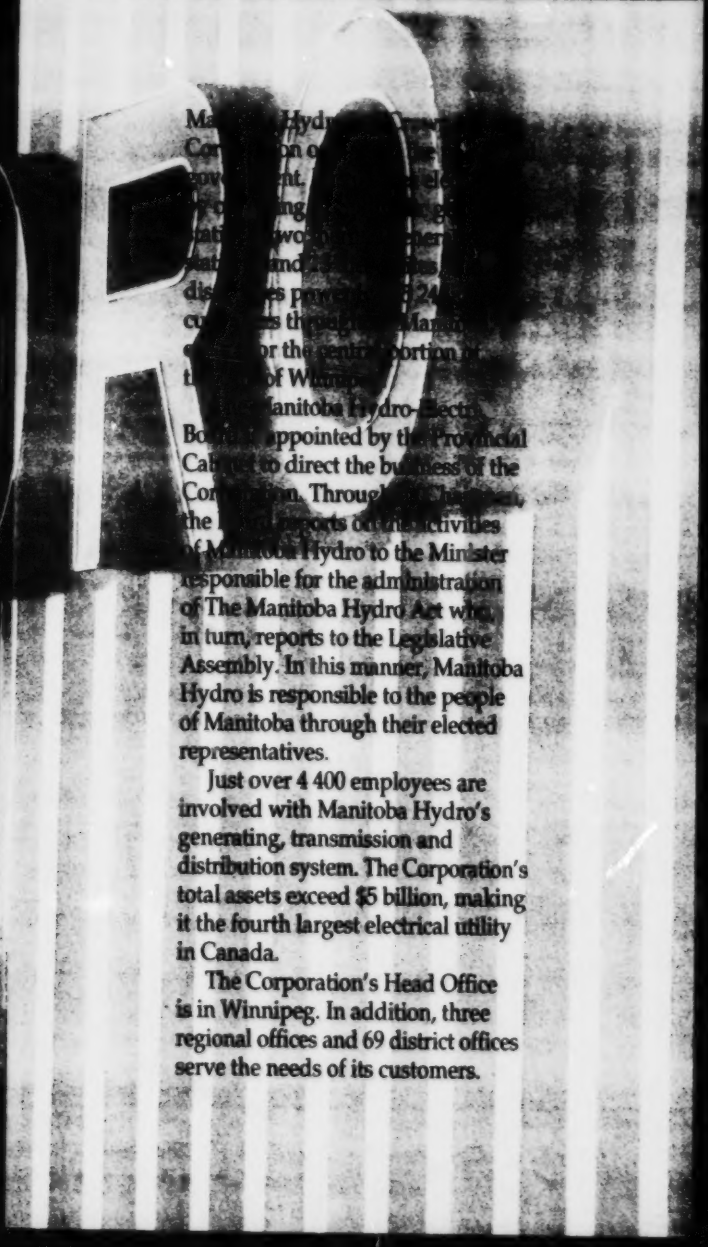
I have the h[illegible] th[illegible]
40th Annual [illegible] Manitoba
Hydro-Electr[illegible] the Manitoba
financial state[illegible] fiscal year
ended March 3[illegible]



Respectfully submitted,

John S. McCallum
Chairman
The Manitoba Hydro-Electric Board

CORPORATE PROFILE



Manitoba Hydro-Electric Board appointed by the Provincial Cabinet to direct the business of the Corporation. Through the Board, the Corporation reports on its activities of Manitoba Hydro to the Minister responsible for the administration of The Manitoba Hydro Act who, in turn, reports to the Legislative Assembly. In this manner, Manitoba Hydro is responsible to the people of Manitoba through their elected representatives.

Just over 4 400 employees are involved with Manitoba Hydro's generating, transmission and distribution system. The Corporation's total assets exceed $5 billion, making it the fourth largest electrical utility in Canada.

The Corporation's Head Office is in Winnipeg. In addition, three regional offices and 69 district offices serve the needs of its customers.

THE MANITOBA HYDRO-ELECTRIC BOARD

The Manitoba Hydro-Electric Board
Back row, from left to right: William E. Cheater, Clyde R. McBain, Harold J. Perkins, Charles E. Curtis, Rod J. Beaudry, Terry R. Stratton, Edmund Kuffel. Front row, left to right: Kenneth S. Patino, Rosemary L. Vodrey, Darlene R. Hildebrand, *Vice-Chair* and John S. McCallum, *Chairman*.

John S. McCallum
Chairman
Faculty of Management
University of Manitoba

Darlene R. Hildebrand
Vice-Chair
Account Manager
Royal Trust

Rod J. Beaudry
Production Division
Manitoba Hydro

William E. Cheater
Regional Services Department
Manitoba Hydro

Charles E. Curtis
Deputy Minister of Finance
Province of Manitoba

Edmund Kuffel
Faculty of Engineering
University of Manitoba

Clyde R. McBain
President and
General Manager
Ancast Industries Limited

Kenneth S. Patino
General Engineering Division
Winnipeg Hydro

Harold J. Perkins
Office of Extension
Brandon University

Terry R. Stratton
Managing Partner
The IKOY Partnership

Rosemary L. Vodrey
Member of Legislative
Assembly for Fort Garry
Province of Manitoba

CHAIRMAN'S MESSAGE

This is the 40th Annual Report of The Manitoba Hydro-Electric Board. Although the business and technological environment has changed enormously over those 40 years, the task of The Manitoba Hydro-Electric Board remains constant: to carry out the corporate mandate under The Manitoba Hydro Act in light of contemporary values and conditions. The Act mandates the Corporation "to provide for the continuance of a supply of power adequate for the needs of the province, and to promote economy and efficiency in the generation, distribution, supply, and use of power."

The economy entered recession as the 1990-91 year began and remained in recession at year-end. By historical standards, this recession has been long and deep; few sectors of the provincial economy have been spared.

The satisfaction of its customers and the efficiency of the Corporation are primary objectives of the Board. Recession always complicates the achievement of these goals but in the year past, it is my belief that the Corporation has performed admirably.

Manitoba Hydro's employees are to be congratulated for their efforts on the Corporation's behalf in what by any standards has been a difficult economy. The Board thanks every employee for making the best of difficult economic circumstances.

For the first time, the Corporation put forward for public review its plans for meeting the future electricity needs of Manitobans. After a comprehensive hearing process before The Public Utilities Board of Manitoba (P.U.B.), the Board was gratified to receive the endorsement of the P.U.B. for its development plan. The P.U.B.'s summary Findings and Recommendations contained the following statement:

"Based on comparisons of net economic benefit, reliability and risk, the Board (P.U.B.) concludes that the Preferred Development Plan proposed by Manitoba Hydro is the least cost option; that it would result in lower customer rates from 1996 to at least 2027; that it provides the highest level of reliability and the lowest ratio of risk to benefits."

The Manitoba Hydro-Electric Board is committed to demand side management. A 100 megawatt reduction in the growth of electricity use by the year 2001 has been targeted. This target will be refined as detailed information is gathered about the costs and the likely success of conservation programs in Manitoba. The Power Smart program evidences the Board's commitment to conservation. The Board intends that the principles of sustainable development be applied to Corporation activities and planning.

In February 1991, Manitoba Hydro appeared before The Public Utilities Board with a multi-year proposal for increases to its rates. In its decision, the P.U.B. granted an increase for only one year that was below Manitoba Hydro's request.

One of the goals of the Board is to move the Corporation to a stronger equity base. At present, the Corporation has the second highest debt/equity ratio among electric utilities in the country. A poor debt/equity ratio reduces financial flexibility. It can also lead to higher borrowing costs.

The Board has set long-term financial targets that reflect a responsible position for the utility. Increasing the Corporation's financial reserves at a prudent rate will be beneficial for the Corporation's customers in the long term.

I want to recognize the contribution of my predecessor as Chairman, Brian Ransom. His leadership in providing policy direction on important issues is an enduring legacy for the Corporation. Mr. Ransom was instrumental in the reaching of settlement agreements with the communities of Chemawawin/Easterville and Moose Lake as compensation for impacts related to the construction of the Grand Rapids Generating Station in the 1960s.

On behalf of the Board, I would like to thank all of those who assisted the Board in its work during the year.

J. S. McCallum
Chairman

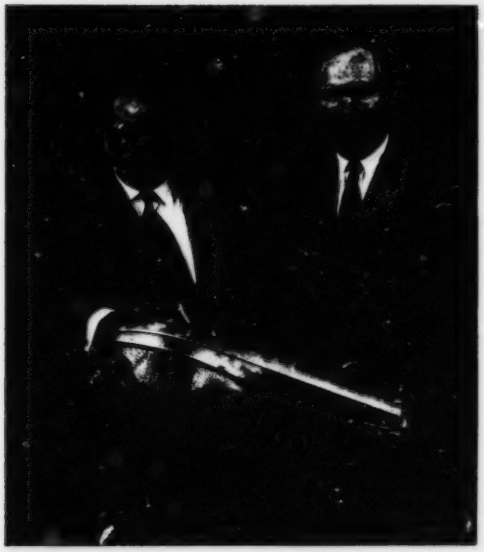
THE EXECUTIVE

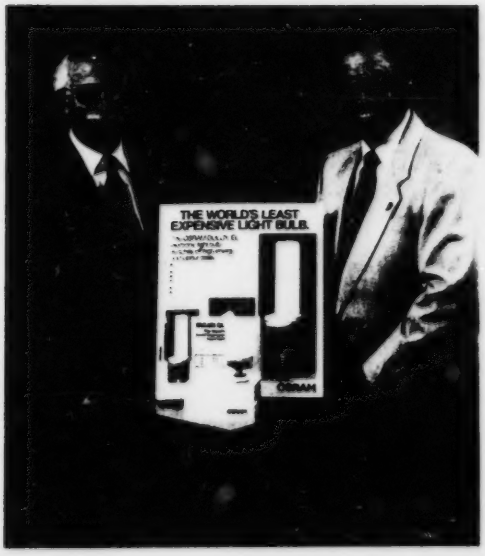
R. B. (Bob) Brennan
President and Chief Executive Officer

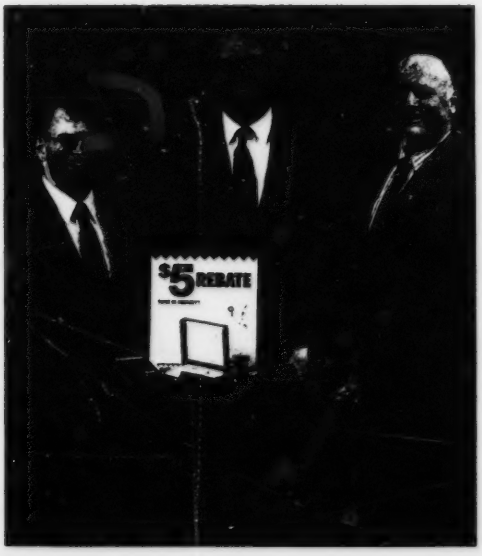
R. O. (Ralph) Lambert
Executive Vice-President

R. M. (Murray) Fraser
Senior Vice-President

K. D. (Doug) Munro
General Counsel and Corporate Secretary







W. J. (Will) Tishinski
Vice-President Customer Service

D. L. (Dennis) Riehl
Vice-President Personnel and Services

P. R. (Paul) Thompson
Vice-President Facilities Planning

D. A. (Don) Kilgour
Vice-President Engineering and Construction

I. W. (Ian) Dickson
Vice-President Environmental Affairs

PRESIDENT'S MESSAGE

The fiscal year 1990-91 was one of considerable achievement for Manitoba Hydro. Among the major accomplishments, which were largely attributable to the outstanding teamwork and dedication of the Corporation's employees, were:

- Net income reached an all-time high of $48.6 million for the year ended March 31, 1991. This represented a substantial improvement over the net income of $24.2 million recorded in the previous fiscal year.
- There was a major commitment to energy conservation.
- The first four units of Limestone Generating Station were placed in service ahead of schedule and under budget.
- The Corporation's development plans for major generation and transmission facilities received the endorsement of The Public Utilities Board.
- The employee safety record was substantially improved.
- A major settlement was reached with the people of Chemawawin/Easterville and Moose Lake with respect to outstanding responsibilities related to the development of the Grand Rapids Generating Station.
- An agreement was reached with the Cross Lake Band of Indians to construct a weir that will create a water regime on Cross Lake that reduces or eliminates the adverse effects caused by the Lake Winnipeg Regulation project.
- An export sale agreement was signed with Ontario Hydro which provides for delivery by Manitoba Hydro of 200 megawatts of firm capacity in each year of the three-year agreement. The agreement came into effect in November 1990.

Manitoba Hydro's increased emphasis on energy conservation and environmental protection was supported by initiatives on several fronts. The establishment of the position of Vice-President Environmental Affairs, led to the development of an environmental credo which will ensure that Manitoba Hydro plays a leadership role in the protection and enhancement of the environment. The adoption of the Power Smart theme to promote the Corporation's demand side management objectives will assist in reducing the growth of the province's electrical consumption in a manner that is cost-effective, sustainable, serves our customers' needs and meets the public concern for the environment.

Power Smart is a theme that facilitates ready identification of energy-efficient products and programs. It will convey to Manitobans the concepts behind Manitoba Hydro's energy conservation activities and by acting in concert with other Power Smart utility partners, it will allow the Corporation to influence manufacturers and retailers, to advertise on a national basis, to act with others to develop standards and to reduce administrative costs associated with conservation programs.

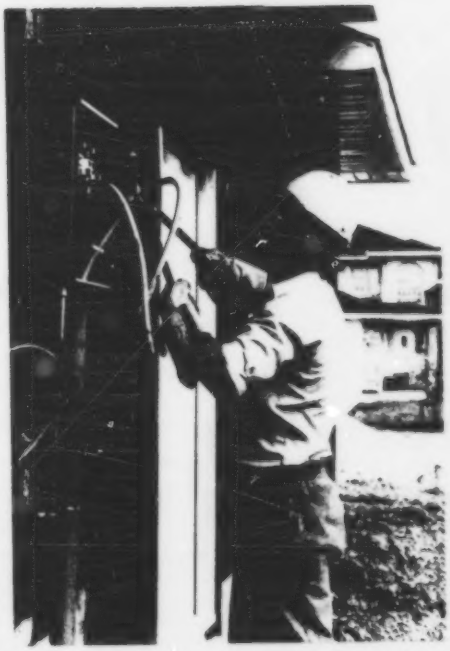
Manitoba Hydro's development plans for new generation and transmission facilities received the endorsement of The Public Utilities Board. This has allowed the Corporation to proceed to the next step of obtaining environmental approvals. The upcoming federal/provincial reviews will allow for full public disclosure of the environmental impacts of such major projects as the Conawapa Generating Station and the Bipole III transmission line. Manitoba Hydro fully supports this public environmental review as a very positive process.

Manitoba Hydro's commitment to enhancing service to its customers was also reinforced during the year with increased emphasis on employee training and development programs. Service quality was improved in several jurisdictions and further system enhancements are being made to improve system reliability in rural and remote areas of the province. It was especially gratifying during the past year to be ranked as the best electrical utility in Canada in terms of the image we convey to our customers.

Financially, the Corporation is progressing towards attaining its minimum reserve level target of $370 million by 1994-95. This will continue to be a considerable challenge and to be successful in attaining this target, we will require a combination of favorable water conditions, rigorous control over expenditures and rate increases close to the rates of inflation for the next three years.

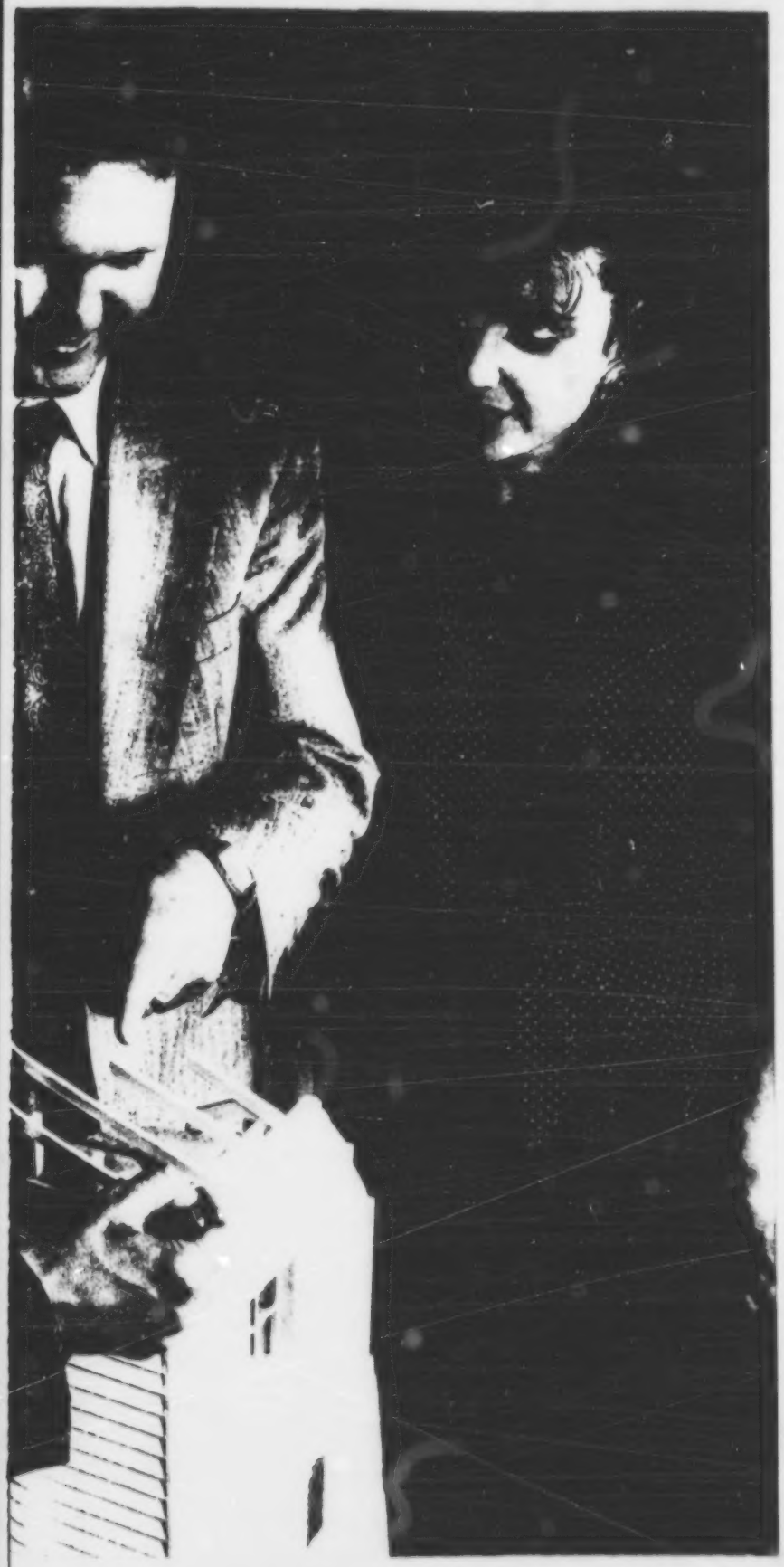
I would like to sincerely thank all the employees for their contributions to the success of Manitoba Hydro over the past year. I would also like to thank the Chairman of The Manitoba Hydro-Electric Board and the Board Members for their guidance and support during my first year as President and Chief Executive Officer.

R. B. Brennan, C.A.
President and Chief Executive Officer



FIRST CONTACT: (Above) For many customers, the local district office is the first, and sometimes only, contact they have with the utility whether it is connecting a new service or discussing their electric bill. Gary Lalchun, Assistant District Operator, Fort Garry connects a new service in the Winnipeg Fort Whyte housing development area.

RETROFITTING THE HOME: (Right) Residential Marketing Engineer Marv Eyolfson demonstrates to home-owners who heat electrically how to reduce heat loss and increase the energy efficiency of their home through insulation, airsealing and energy-saving products.



CUSTOMER SERVICE

Manitoba Hydro has a fundamental commitment to excellent customer service and satisfaction. This commitment is adopted and practised by all Manitoba Hydro employees. To this end, throughout the year, the Corporation's employees have worked diligently towards ensuring that customers receive prompt assistance regarding their energy concerns and that service interruptions are kept to a minimum.

As Manitoba Hydro approaches the 21st Century, it recognizes the impact its customers can have in reducing energy waste and thereby helping to protect the environment. In public reviews such as The Public Utilities Board hearing into the Corporation's development plans for major generation and transmission facilities, customers found a means to express their views on the planning activities of the utility. From early indications, customers are interested in working with the Corporation to find ways to use electricity more efficiently in order to slow the demand for energy.

The Corporation's goal to achieve a reduction in load of 100 megawatts by the year 2001 will rely heavily on this special customer–utility partnership in order to reach this target. The 100 megawatt target has been adopted as the underlying mandate in the programs and plans the utility develops.

In the Home CHEC-UP program, specially trained energy advisors inspect residences to assess their energy efficiency and to provide advice to customers on improvements. These are called energy audits. In the past fiscal year, there were 3 301 applications received for energy audits. The Provincial Government funded the Home CHEC-UP program during the year and effective in April 1991, Manitoba Hydro will assume

financial and delivery responsibility for the CHEC-UP program for all-electric homes in the coming year. Manitoba Hydro intends to revise the program and integrate it with its long-term Power Smart energy conservation plans. Power Smart was introduced early in the 1991-92 fiscal year as a theme for encouraging the conservation of electricity by Manitobans and will embrace a range of programs for residential, commercial and industrial customers aimed at reducing the growth in consumption of electricity.

During the 1990-91 fiscal year, the number of Manitoba Hydro customers grew by 3 176, an increase of 0.9 per cent to a total of 375 245. Residential customers grew by 0.9 per cent to reach 328 620. General Service and miscellaneous customers totalled 46 625 at March 31, 1991, an increase of 0.6 per cent over last year.

The Corporation took initial steps in providing information to Francophones in Manitoba with the launch of French Language Services in the fall of 1990. All districts in designated areas and Head Office in Winnipeg have information in both official languages. Preprinted information on customer bills is now bilingual.

PUBLIC ACCOUNTABILITY

Pursuant to The Crown Corporations Public Review and Accountability Act (The Crown Corporations Act), Manitoba Hydro held public meetings in Leaf Rapids, Glenboro and Winnipeg. These meetings enabled the public to comment on the Corporation's policies and practices and the issues facing Manitoba Hydro.

An additional requirement under The Crown Corporations Act is the establishment of an Employee Advisory Council. Manitoba Hydro's Employee Advisory Council met four times in the past year to promote communication between the Corporation and its various bargaining units and employee representatives on matters which are not part of collective bargaining.

As Manitoba Hydro approaches the 21st Century, it recognizes the impact its customers can have in reducing energy waste

Manitoba Hydro met with the Crown Corporations Council, established under The Crown Corporations Act, to discuss the current strategic issues of the Corporation and appeared before the Legislative Assembly of Manitoba Standing Committee on Public Utilities and Natural Resources in the past year to review the previous year's Annual Report.

In late summer and continuing into the fall, Manitoba Hydro presented its development plans for major generation and transmission facilities at a public hearing conducted by The Public Utilities Board. Bringing the Corporation's development plans before the public for review was a historic first for the utility.

In February 1991, Manitoba Hydro appeared before The Public Utilities Board of Manitoba at a rate hearing in Winnipeg and at public meetings in Brandon, The Pas and Thompson.

In addition, Manitoba Hydro meets all the normal regulatory and licensing requirements for a broad range of activities, from weed control on its rights-of-way, paying water rental fees to the province, to obtaining operating licenses for its thermal plants.

SERVICE AREA

Manitoba Hydro's service area, which spans 650 000 square kilometres, is divided into three Regions. Each Region is responsible for planning, designing, constructing, operating and maintaining the electrical distribution system in its area. Western Region is headquartered in Brandon, Eastern Region in Selkirk and Central Region in Winnipeg.

Regional staff have the primary responsibility for dealing with customers and they are the day-to-day contacts for service, billing and most other matters. Some 1 550 Regional personnel look after the needs of the Corporation's 375 245 customers.

More than 49 per cent of Manitoba Hydro's total staff work outside of Winnipeg in approximately 90 locations.

One of the last agricultural areas in the province to receive electrical service was Peonan Point which juts into the north end of Lake Manitoba. The seven local families serviced by the new 60 kilometre line are now experiencing a reduced cost for their energy supply. The cost of the project was shared by Manitoba Hydro, the Provincial Department of Northern Affairs and the residents.

Work has begun to upgrade the community of Brochet from 15 to 60 ampere service. Brochet is one of six northern diesel sites that will receive upgraded service over the next few years. Communities to be upgraded to 60 ampere service and their planned in-service dates are as follows: Lac Brochet, 1992; Tadoule Lake, 1994; Shamattawa, 1995; and

Pikwitonei and Thicket Portage, 1997. Once the enhanced diesel service is available, it will provide for the use of all basic electrical amenities with the exception of space heating.

Several major businesses are undergoing or proposing load expansions. Manitoba Hydro assisted Hudson Bay Mining and Smelting in Flin Flon with energy management studies to suggest ways in which they could minimize their energy use in preparation for their proposed expansion plans for 1992-93. The expansion could increase the company's demands from 80 to 110 megawatts.

In addition, Dow Corning and Inco Ltd. Manitoba Division indicated that they are expecting to expand their operations resulting in an eventual load of 100 megawatts for Dow Corning and up to 200 megawatts for Inco, over the next several years.

Manitoba Hydro's regional upgrading and replacement of customer service buildings to provide appropriate customer service areas with functionally designed buildings continued. The retrofitting of the Brandon Western Region office was completed as well as the construction of new district offices in Reston, Grandview, Powerview, Niverville and Piney. A new Customer Service building was also obtained in Winnipeg for the Fort Garry district.

THE $5 OUTDOOR TIMER REBATE

To reduce the demand for electricity during peak winter periods, Manitoba Hydro is encouraging consumers to use an outdoor timer for automobile block heaters and/or interior car warmers.

A $5 rebate offered with the purchase of the outdoor timers when the program was initiated in 1989 generated a high rate of customer response. Over the past two years, approximately 15 000 rebates have been provided. The objective for 1991-92 is 10 000 units.

Manitoba Hydro recommends products specifically manufactured for outdoor automotive heating requirements such as outdoor timers, interior car warmers, engine block power saver cords and has developed a rebate incentive with industry and the retail sector to promote customer awareness and sales. For the customer, outdoor timers bring reduced energy costs through an affordable energy-efficient device with a short payback period. For the utility, the program is targeted to save approximately 9 000 kilowatts in demand and 26 million kilowatt hours in energy per year.

EMPLOYEES

Efficient and courteous employees are critical to the successful operation of any business. Throughout the past year, Manitoba Hydro employees continued to demonstrate their commitment to accountability, quality and teamwork that contributed to the utility's efficient and effective operations.

Employment reached a peak of 4 461 in August 1990, compared to 4 310 in the previous year. The Corporation continues to enjoy the benefits of having a number of long-service employees. As of year-end the Corporation had 13 employees with 40 years and more of service, 51 employees with 35 to 39 service years, 509 with 25 to 34 years and 1 345 with 15 to 24 years. A total of 51 employees retired during the year.

The Kelsey Generating Station fly-in operation was established out of Thompson. Kelsey staff will live in Thompson and be flown to the site for their shifts.

The Production Division is being reorganized into two divisions. The Northern Division will be stationed in Gillam and the Southern Division in Winnipeg. The reorganization is designed to create a strong management team in Gillam to work directly with the employees who operate and maintain the extensive and vital facilities on the Nelson River. Similarly, the reorganization provides for an effective management team to operate and maintain the production facilities in the south.

In addition, an External Benefits Department was created to ensure that Manitoba Hydro's major projects provide employment, training and business opportunities for all residents of Manitoba. Increased emphasis will be given to employing northern aboriginals and other northern residents.

Collective agreements between the Corporation and the Canadian Union of Public Employees, Local 998 and the Association of Manitoba Hydro Staff and Supervisory Employees expired on December 19, 1990 and March 27, 1991, respectively. The current collective agreement between the Corporation and the International Brotherhood of Electrical Workers, Local 2034 expires in May 1991.

In August 1990, Manitoba Hydro approved a new system that will be used to evaluate all jobs within Manitoba Hydro. Under the guiding principle of equal pay for work of equal value within each employee jurisdiction, the Corporation has begun obtaining job data on all positions. This process will be staged according to employee jurisdiction and will take approximately two years to complete. Any proposed changes to salary plans that arise out of this process will be negotiated with the respective bargaining unit.

Employees continue to make use of a full range of in-house courses including a newly created French Language Training Program and a series of evening computer classes. Employee career development services were introduced that include career pathing and continuing education information and workshops. Many employees took advantage of Manitoba Hydro's tuition rebate program.

EMPLOYMENT EQUITY

Manitoba Hydro continues its commitment to employment equity for women, aboriginal peoples, persons with disabilities and members of visible minority groups. Fair access to employment and developmental opportunities is a major corporate goal. Overall representation in these groups increased this year and expansion in equity development occurred with employees participating in local and regional career fairs to convey information on entry level requirements.

Bursaries were awarded to 12 exceptional target group students entering first year studies in a university or community college program related to engineering and technical operations. And the Summer Student Work Experience Program – Northern Operations was expanded this year from 13 aboriginal high school students to include 17 more, all obtaining relevant employment near their home communities.

HANDS ON: As a member of a line trades training curriculum design task force, Len Kendzierski, Assistant District Operator, Ste. Rose demonstrates the procedure to change a dead end insulator on a 7200-volt energized line.

SAFETY

Safety is a prime concern to Manitoba Hydro. The Corporation is committed to taking all reasonable steps to minimize risk of injury, death and sickness to its employees, contractors and members of the public, resulting from its operations and facilities. It is the Corporation's belief that accident prevention goes hand in hand with all other aspects of running a business effectively.

The Corporation develops and administers accident, fire, occupational health and workplace environmental protection programs along with first aid and general damage loss control policies and programs. Along with the joint management–union safety committee that reviews safety policy matters, the Corporation also has in place a total of 35 joint management–worker Workplace Safety and Health Committees to respond to safety and health concerns in workplaces as well as to ensure compliance with related legislation.

Since its inception in 1972, the Key Safety Representative Program for major fieldwork groups and locations such as operating centres, generating stations, construction zones and projects continues to be a major factor in the favorable safety record of Manitoba Hydro. At the present time, 53 Key Safety Representatives provide liaison and a communication network to approximately 2 800 field workers as well as 31 field Workplace Safety and Health Committees. Regularly scheduled safety meetings for field staff are an essential component of the Corporate accident prevention program.

Manitoba Hydro's work safety record, in terms of frequency of disabling injuries, ranked among the top four of 15 major Canadian electrical utilities for the 27th consecutive year. While this type of comparison is useful for the Corporation as a means of measuring its performance in the area of safety, Manitoba Hydro is always looking to improve its safety record since any injury or accident is unacceptable.

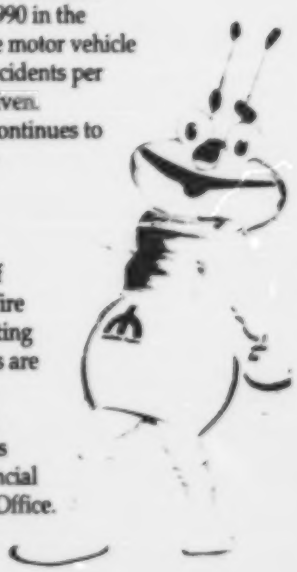
The number of disabling injuries decreased by 20 per cent from 10.1 per million hours worked in calendar year 1989 to 8.1 in 1990. Tragically, these statistics include one fatality which occurred when a lineman contacted a 7200 volt conductor.

A major research and development project in the area of safe temporary grounding procedures has been undertaken. The safety of employees while working on de-energized lines and equipment is the main focus of the project. A scale-model training unit complete with transmission lines and utility vehicles has been developed as well as a computer-based demonstration unit. Other Canadian utilities have expressed considerable interest in the project.

Manitoba Hydro ranked second in the field of 15 major Canadian electrical utilities in 1990 in the category of recordable motor vehicle accidents with 3.24 accidents per million kilometres driven.

Manitoba Hydro continues to support an active fire prevention and protection program. A total of 130 volunteer members of the Corporation's 11 fire brigades at its generating and converter stations are currently enrolled in the Level 1 Industrial Firefighter Program as certified by the Provincial Fire Commissioner's Office.

READING THE MAGNETIC FIELDS: *Occupational Health Nurse Bernice Kolbuch uses the Emdex meter to sample the strength of magnetic fields in a home. Emdex stands for electric and magnetic digital exposure meter and contains electronics that record a complete time-history of the magnetic field for the measurement period over which it is operated. Manitoba Hydro carries out magnetic field readings on request.*



LOUIE, LOUIE: *Louie the Lightning Bug, Manitoba Hydro's safety mascot drew crowds this year when he appeared on one of the Corporate floats at Manitoba fairs during the summer, in costume at trade shows, day-care centres, and other special events. Louie delighted Brownie and 4-H groups and appeared on television and in newspapers to educate young children about the safe use of electricity. Because of his popularity, the program will be expanded next year.*

There were reports of 28 fires involving Corporate property in the calendar year 1990. This was a decrease of 32 per cent from the previous year.

Health and wellness education for employees continued during the year with a high degree of employee interest and participation.

Public interest and concern regarding adverse health effects, purportedly associated with exposure to magnetic fields from power lines, electrical equipment, home wiring and appliances, has increased in response to events reported in the media. Manitoba Hydro has responded by taking measurements of magnetic and electric fields in and around residences, by participating in research programs and by disseminating information with its billing statements. Active liaison has been established with representatives of the scientific community and public health agencies to exchange information on current developments in this area.

A safe-fishing facility was constructed on the downstream side of the Pine Falls Generating Station on the Winnipeg River. This program is currently being extended to other hydro generating stations to improve the safety of the public while fishing in these areas.

PAINTING THE NIGHT ORANGE

Everything is coming up orange! As evidenced by the growing number of dots of orange warmth in communities throughout the province, high-pressure sodium (HPS) lighting is slowly changing the look of the night. Over the next five years, HPS lighting and its distinctive illumination of orange will replace the familiar incandescent yellow and bluish-white of mercury vapor street lights and sentinel (farmyard) lighting.

Approximately 63 000 street lights and 17 000 sentinel lights will be converted. HPS lights are more energy-efficient; they provide the same illumination output while using 47 per cent less electricity than mercury vapor lamps. The customer will notice an increased level of brightness, and reduced energy costs. For the utility, the conversion will reduce power use by 11 000 kilowatts in demand and 42 million kilowatt hours in energy annually. This is equivalent to the power used by a town the size of Neepawa.

Manitoba Hydro has begun the conversion of mercury vapor to HPS in its own backyard. The utility's Head Office and Waverley Service Centre complex parking lots in Winnipeg have 'gone orange' in the past year. As well, almost 50 per cent of Brandon's lighting has been converted to HPS. During the past year, several other rural communities have begun the switchover to HPS lighting.

ENVIRONMENTAL MANAGEMENT

Environmental issues arising from the development and operation of Corporate facilities continue to be an important priority for the utility. The Corporation has appointed a Vice-President of Environmental Affairs to further advance the efforts by Manitoba Hydro to prevent, avoid and reduce environmental effects associated with new project development.

Environmental management activities expanded in the planning, design, construction and operation of energy developments in the 1990-91 fiscal year.

All components of Manitoba Hydro's development plan are subject to an environmental impact assessment. Consultation with groups and individuals with interests in the development of Conawapa, Bipole III, the Manitoba/Ontario interconnection and the Thermal Life Assurance Program is a key element of the environmental assessment process.

In addition to detailed technical studies by experts, these assessments involve extensive public consultation. During the year, approximately 65 meetings (bringing the total to about 130) were held with interested groups to obtain their views on the projects.

Site selection and environmental assessment for the North Central Project – a plan to connect seven remote diesel communities to central supply – also included contact with the seven northeast Manitoba communities. The peop' contacted provided valuable assistance and their participation in the planning process for new projects is appreciated. The environmental impact assessments included analysis of specific environmental issues by experts in the natural and social sciences. These findings will be used by the utility's project teams to plan and design measures for reducing adverse effects and for enhancing project opportunities.

MANAGING PCBs

Manitoba Hydro is a leader in Canada in the handling and treatment of PCB-contaminated material. PCBs (polychlorinated biphenyls) are synthetic oil-like substances that are environmentally persistent and difficult to destroy. PCBs are fire-resistant and very stable. These qualities lead to their use as an insulating fluid in various types of electrical equipment. Although Manitoba Hydro has very small quantities of pure PCB oil, it does use insulating oil that has been contaminated with small amounts of PCBs. Any fluid containing 50 parts per million or more is considered to be contaminated and a possible risk to the environment. Since 1985, Manitoba Hydro has been operating special equipment which chemically destroys the PCB content in low-level contaminated insulating oil and leaves the oil clean and reusable. Over 68 per cent of the Corporation's estimated total of oil containing more than 45 parts per million of PCB has been treated.

In the 1990-91 year, 1 931 533 litres of oil were treated, bringing to more than seven million litres the total volume of oil decontaminated to date.

FISH WATCHING: In July, a weir on the Limestone River approximately two kilometres upstream of the mouth was built to assist biologists in monitoring the migration of fish upstream and downstream during the entire open water season. The data collected will be used to provide baseline data for the Environmental Impact Assessment of the proposed Conawapa Generating Station.

MITIGATION

Manitoba Hydro continues to implement its policy of ensuring that all who are adversely affected by its projects are dealt with fairly and equitably through mitigation and compensation programs.

The Churchill River Diversion and Lake Winnipeg Regulation projects, undertaken in the early 1970s, allowed Manitoba Hydro to significantly increase the capacity of the Nelson and Burntwood rivers to produce electric power. These projects are essential to the effective operation of the current generating stations on the Nelson River including the Limestone Generating Station which is in the final stages of construction and a number of stations planned for the future. While electricity consumers in Manitoba are continuing to benefit from these water diversion and regulation projects, several communities have been affected by them. To date, Manitoba Hydro has provided in excess of $97.0 million in compensation and remedial measures to ameliorate related losses or damages.

A significant part of the Corporation's activity has been directed at five Indian Bands which have experienced adverse effects as a consequence of the projects. These Bands which make up the Northern Flood Committee, along with the Government of Canada, the Province of Manitoba, and Manitoba Hydro are signatories of the Northern Flood Agreement (NFA) which was signed in 1977. This Agreement provides a formal mechanism by which the five Bands can obtain compensation for adverse effects of the projects. The Agreement ensures discussion on cause or extent of adverse effects and facilitates implementation of appropriate response programs. The Agreement allows parties to seek resolution through an arbitrator when required.

Manitoba Hydro has since 1979 processed over 3 251 claims from individuals who claimed adverse effects, with 2 998 settled to the claimants' satisfaction. Approximately 136 of the individual claims have been rejected outright, with 117 still under review. In addition, the Bands have filed approximately 155 claims with the arbitrator, of which 138 involve Manitoba Hydro. Seventy-seven of the major claims have been negotiated, six have required review and final award by the arbitrator and the remaining 55 claims are active.

In the last fiscal year, resource harvesting claims were settled related to Cross Lake Domestic/ Commercial Fishing, Cross Lake Domestic Fishing, Split Lake Community Trapping and Nelson House Community Commerical Trapping.

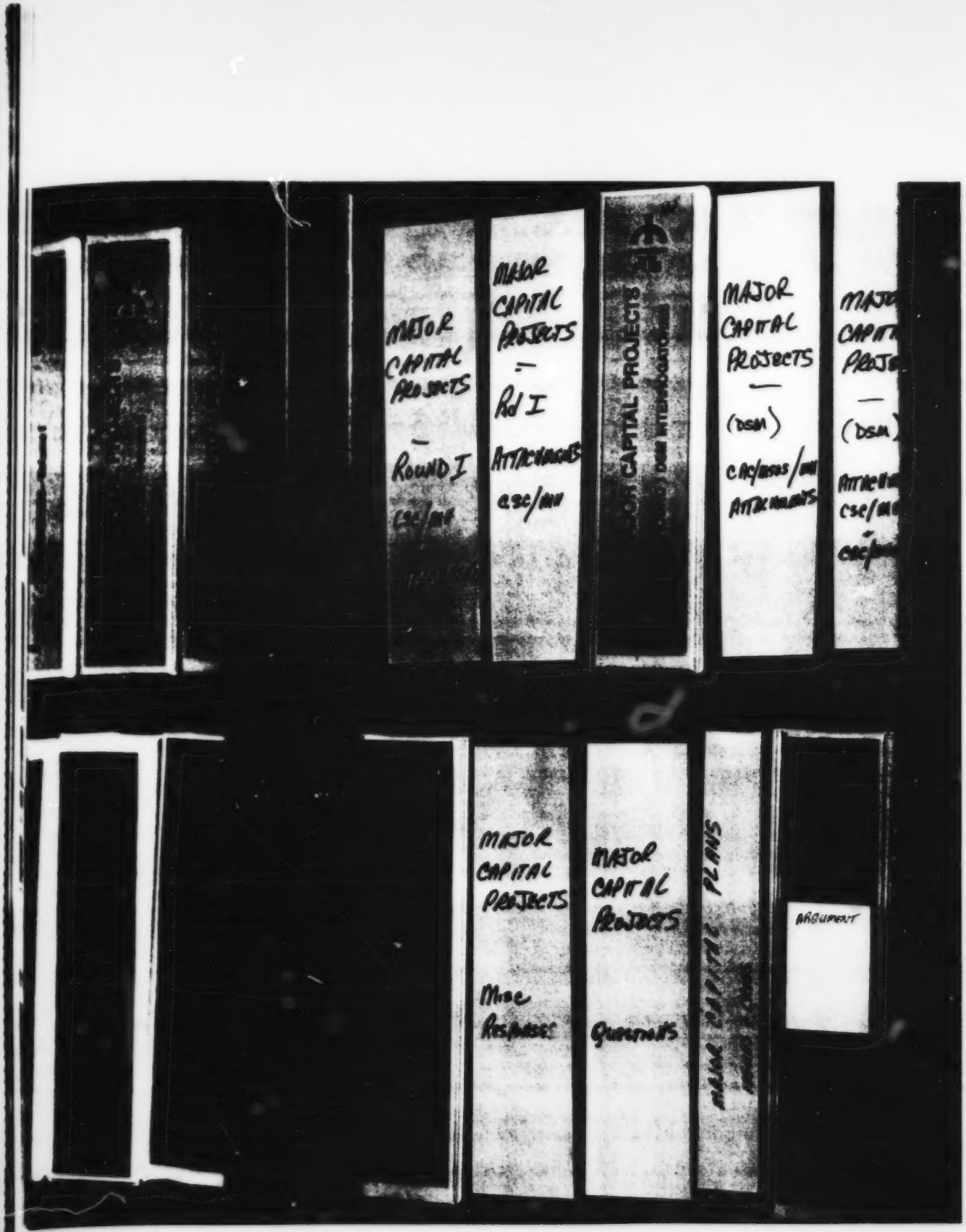
A $9.2 million contract was awarded for the construction of the Cross Lake Weir and related excavations. The contract was awarded to a joint venture which included Midnorth Development Corporation, the construction arm of the Cross Lake Indian Band. The work represents a Manitoba Hydro initiative to address the environmental impacts caused by the Lake Winnipeg Regulation project, begun in the 1970s as part of the overall hydroelectric development of the Nelson River. The weir will create a water regime on Cross Lake that reduces or eliminates the adverse effects caused by the Lake Winnipeg Regulation project.

During the past year, the parties to the NFA made a concerted effort to reach a Global Settlement for outstanding claims. The initiative came to an end in the latter part of the year, however, when four of the five Bands rejected the Proposed Basis of Settlement fashioned by the senior negotiators. The parties have agreed to implement the NFA for the four Bands in accordance with the terms and conditions of the NFA.

One of the five Bands (Split Lake Cree First Nation) elected to pursue a separate settlement, and a Proposed Basis of Settlement was achieved in December 1990 with a subsequent advance of $2.5 million made. The parties expect to finalize the Split Lake settlement by June 1991.

Manitoba Hydro is also reviewing the impact of its projects not covered by the Northern Flood Agreement. Manitoba Hydro concluded settlement agreements with the Chemawawin/Easterville and Moose Lake communities for impacts related to the construction of the Grand Rapids Generating Station. The Chemawawin First Nation and the community of Easterville received $13.7 million in compensation while the Moose Lake Band of Indians and the community of Moose Lake received $7.355 million.

Manitoba Hydro has also begun studies into the feasibility and design of a facility capable of controlling the levels of North Moose and Cormorant lakes. As part of this investigation, environmental impact studies are being conducted to determine the lake level regulation most suited to the affected communities in the area.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ARGUMENT

A DEVELOPMENT PLAN FOR THE NEXT CENTURY

In November, following 21 days of extensive public hearings regarding Manitoba Hydro's development plan, The Public Utilities Board (P.U.B.) endorsed Manitoba Hydro's proposals with respect to major capital projects required for power generation and transmission well into the 21st Century. The public review was an historic first for the utility and entailed an exhaustive six month preparatory period by Manitoba Hydro staff, the P.U.B., its experts, and intervenors from a wide range of public interest groups – all prior to the 21 days of public hearings.

The development plan involves the undertaking of four major initiatives: the sale of 1 000 megawatts (MW) of electricity to Ontario Hydro for 22 years, starting in the year 2000; diversity exchange agreements totalling 300 MW with two American utilities, Northern States Power (NSP) and United Power Association (UPA), starting in 1995 and lasting for 20 years; refurbishment of Manitoba Hydro's thermal generating stations at Brandon and Selkirk (Thermal Life Assurance Program); and a 100 MW reduction in electrical load by the year 2001 through energy conservation known as demand side management (DSM).

The validity of the Corporation's plan was closely examined not only by P.U.B. experts but also by many intervenors, including the Consumers Association of Canada (Manitoba), the Concerned Citizens of Manitoba, the Northern Flood Committee and the Manitoba Industrial Power Users Group.

The P.U.B., in its final report, endorsed Manitoba Hydro's plans, noting that *"Based on comparisons of net economic benefit, reliabilility and risk, the Board concludes that the Preferred Development Plan proposed by Manitoba Hydro is the least cost option; that it would result in lower customer rates from 1996 to at least 2027; that it provides the highest level of reliability and the lowest ratio of risk to benefits."*

The P.U.B. also noted that it *"endorses those features of the Manitoba Hydro Preferred Development Plan requiring early commitment; specifically the system participation agreement with Ontario Hydro, construction of Conawapa generation station and Bipole III, diversity agreements with NSP and UPA, DSM initiatives and thermal plant life assurance."*

This endorsement allowed Manitoba Hydro to proceed to the environmental licensing stage.

Manitoba Hydro is also now seeking the approval of the National Energy Board for exports under the 300 MW seasonal diversity exchange agreements to the United States.

Manitoba Hydro encourages non-utility generation in the province as part of the 100 MW load reduction initiative under its development plan. To this end, the utility has called for a public expression of interest in installing generating facilities for the purpose of selling electricity to the Corporation. The purchase price for the non-utility generation will be based on the value to Manitoba Hydro considering savings resulting from deferred plant addition and changed future operating costs.

The utility is continuing to assess the costs and benefits of refurbishing the existing thermal generating stations at Brandon and Selkirk in order to ensure that the units will be able to operate reliably to their planned retirement dates. The possibility of extending

The Corporation's plan was closely examined not only by P.U.B. experts but also by many intervenors, including the Consumers Association of Canada (Manitoba), the Concerned Citizens of Manitoba, the Northern Flood Committee and the Manitoba Industrial Power Users Group.

LISTENING TO THE PUBLIC VOICE: In the latter part of August, Manitoba Hydro participated in an event that would be recorded in the utility's history books. For the first time ever, the Corporation embarked on a public hearing into its major plans for generation and transmission for the next century. Media attention and public interest in the events that unfolded over 21 days were high as Manitoba Hydro presented its testimony and intervenors' arguments were heard before The Public Utilities Board. In November, The Public Utilities Board endorsed Manitoba Hydro's development plan. A sample of the formal submission and background material required for the hearing is shown at left.

THE ROAD TO NEXT GENERATION: In order to protect the in-service date of the Conawapa Generating Station, construction of a 28 kilometre all-weather gravel road was begun in February. The road runs from the community of Sundance to the future generating station site. The completed access road will assist in the ongoing geotechnical investigations and Nelson River water flow and ice studies.

Brandon units 1- 4 until 2005, which is five years longer than the life included in the P.U.B. review, is under study. An environmental assessment is underway concerning Manitoba Hydro's plans to install additional equipment.

Prior to commencing any construction work on Conawapa and Bipole III, Manitoba Hydro must obtain a license under The Environment Act (Manitoba), and approval from the appropriate federal ministers in accordance with the Federal Environmental Assessment Review Process Guideline Order. An Environmental Assessment Review Panel was announced in June 1991 to conduct the environmental hearings associated with the Conawapa complex. It is anticipated that the Panel will begin public hearings on the projects in spring 1992.

Manitoba Hydro continues to carry out its planning, exploration and preparatory activities in compliance with provisions of The Environment Act (Manitoba) and other applicable provincial and federal regulatory requirements.

A Provincial Environment Act license and approval from the federal government have been issued in respect of the access road and the power line to facilitate construction at the Conawapa site. Tenders for the access road were issued and construction has started. Clearing is being carried out by the Nelson House Indian Band's construction company, Nelson House Forest Industries. Clearing for the construction power line was carried out during the winter by the Fox Lake Band.

ONGOING PLANNING ACTIVITIES

Planning activities are continuing concerning Manitoba Hydro's options after the Conawapa Generating Station. These include sites on the Burntwood River and on the Nelson River. Planning activities will involve the environmental impact studies for the generating facilities and transmission lines associated with the options.

MEETING DEMAND THROUGH ENERGY CONSERVATION

Manitoba Hydro's overall goals have traditionally been ensuring the reliable supply of power, promoting the safe use of electricity by the public while maintaining the lowest possible rates.

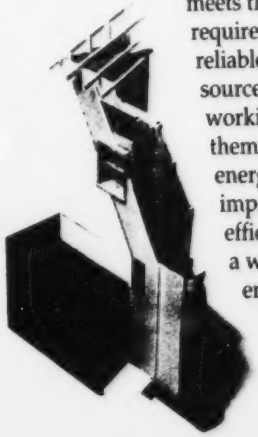
While these responsibilities still remain, in recent years Manitoba Hydro has perceived a need to do more. In meeting the requirement for a reliable supply of power for Manitobans, Manitoba Hydro has looked to develop the province's natural hydroelectric potential by building new generating facilities. But as new energy developments grow more expensive to build and as new technologies appear that can reduce energy consumption, Manitoba Hydro has taken on a new role in managing or influencing the demand for electricity by its customers.

In doing so, the Corporation anticipates that it can reduce the growth in electricity demand thereby delaying the need for major new generating facilities. This reduces capital investments and lessens associated environmental effects.

The key to this stepping-up of conservation efforts, and its anticipated effectiveness, is a range of new technologies that reduce electricity use while providing virtually the same level of service as older technologies. New lighting technologies provide the same amount of illumination at lower wattages. New energy efficient industrial motors can cut consumption by approximately five per cent. Combined with an existing conservation ethic and new ways of marketing and promoting the efficient use of electricity, the new technologies can make a real impact on the growth of electrical demand.

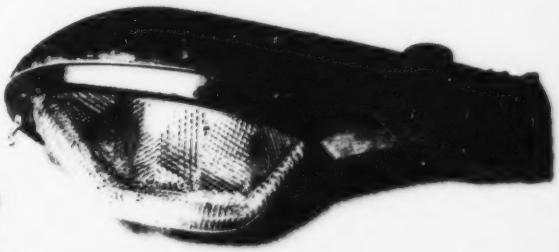
By the year 2001, Manitoba Hydro expects to reduce the growth in electrical demand by at least 100 megawatts – equivalent to the combined consumption of the communities of Dauphin, Steinbach and Portage la Prairie.

The Corporation's conservation program, termed Power Smart, meets the customers' requirement for a reliable, efficient source of supply by working closely with them to reduce energy waste and improve electricity efficiency. Through a wide variety of energy-reduction choices, the utility helps customers to reduce their energy bills.

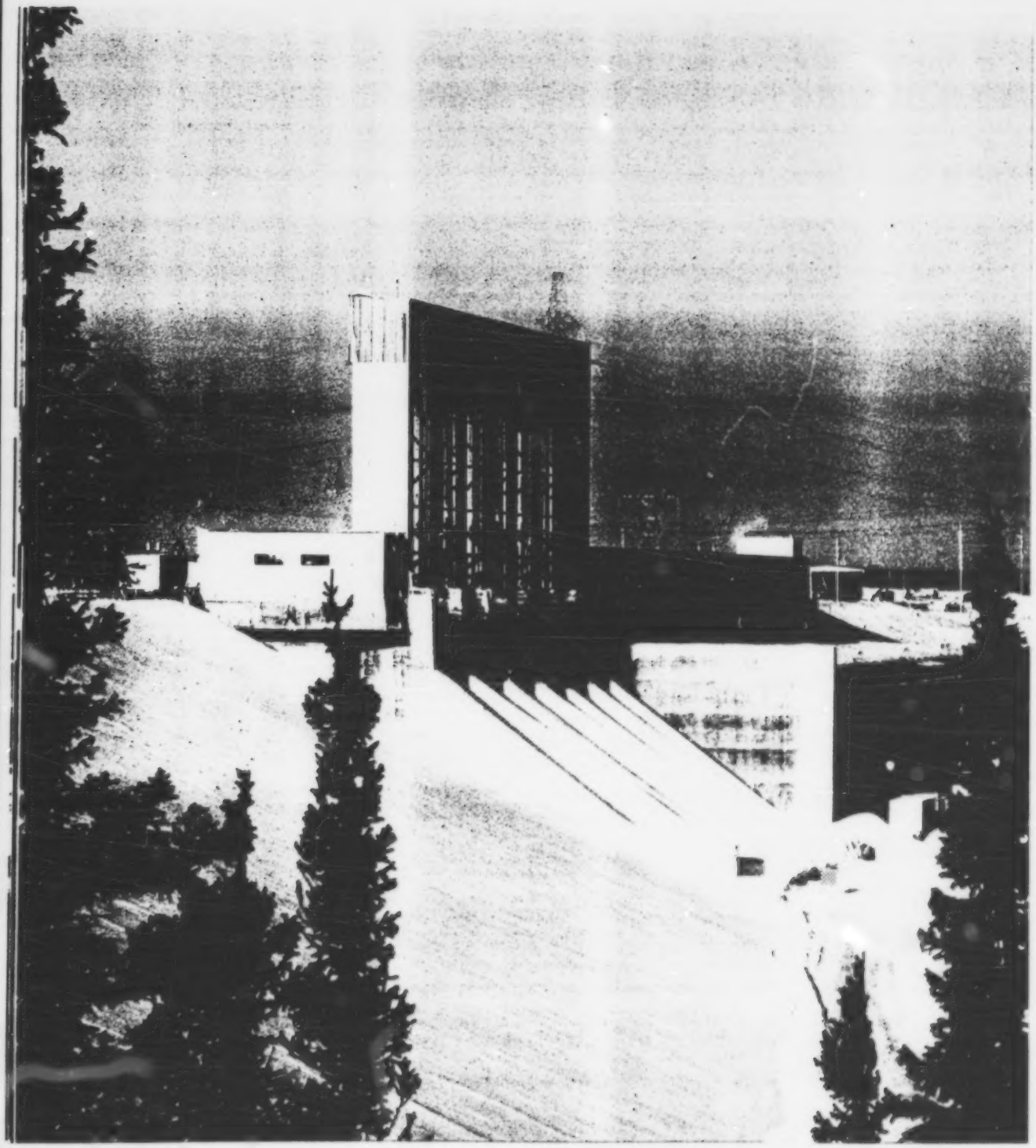


The program helps customers to select the most efficient products and use the most efficient operating procedures. Power Smart involves working with manufacturers to develop product modifications and increasingly efficient devices. It also involves working with consultants and contractors on the application of new standards and techniques to increase efficiency.

During 1990, initial program concepts were identified in order to achieve targets for the residential, commercial and agricultural sectors. Currently, a long-range plan is being prepared to evaluate the conservation potential in Manitoba, to establish new electrical energy conservation targets and to develop programs to achieve the targets. This plan will identify, and attempt to capture all cost-effective attainable conservation.



From a customer service perspective, Manitoba Hydro will continue to encourage its customers to use electricity wisely. Historically, the Corporation has supported conservation programs that promote the efficient use of energy. Now, Manitoba Hydro will step up these efforts by introducing aggressive programs and new products that provide a stimulus for customers to reduce the growth in demand for electricity.



LIMESTONE: FIRST POWER

On September 8, 1990, two and a half months ahead of schedule, unit 1 of the Limestone Generating Station officially joined the provincial power grid, setting the pace for units 2, 3 and 4 to follow throughout the balance of the fiscal year. Each unit is rated at 133 megawatts.

The first unit going on line represented a culmination of five years of activities by thousands of workers since the project's re-start in 1985. The start-up followed two months of pre-commissioning, a mechanical run and electrical acceptance tests. Transformers, generator control devices and computer monitoring equipment are among the items that have undergone rigorous testing to ensure that they have been built and installed to Manitoba Hydro's standards.

The general civil contractor, Bechtel-Kumagai, completed the last primary concrete pour in March 1991 and is currently proceeding with cleanup, architectural finishing and secondary concrete operations in the powerhouse. GE Canada continues work on the manufacture and installation of the remaining six turbines and generators. Electrical and mechanical system installation and painting continue in the powerhouse.

Peak employment at the project in 1990-91 reached 604. Approximately 400 people remained on site during the past winter to continue work inside the powerhouse.

The Nelson-Burntwood Collective Agreement governs the labor relations aspects of the project. This Agreement facilitates the participation of northern aboriginals and other northerners on the project. During the year under review, monthly participation rates for northerners ranged from 31 per cent to 38 per cent and for northern aboriginals from 17 per cent to 20 per cent of the total workforce that is covered by the collective agreement.

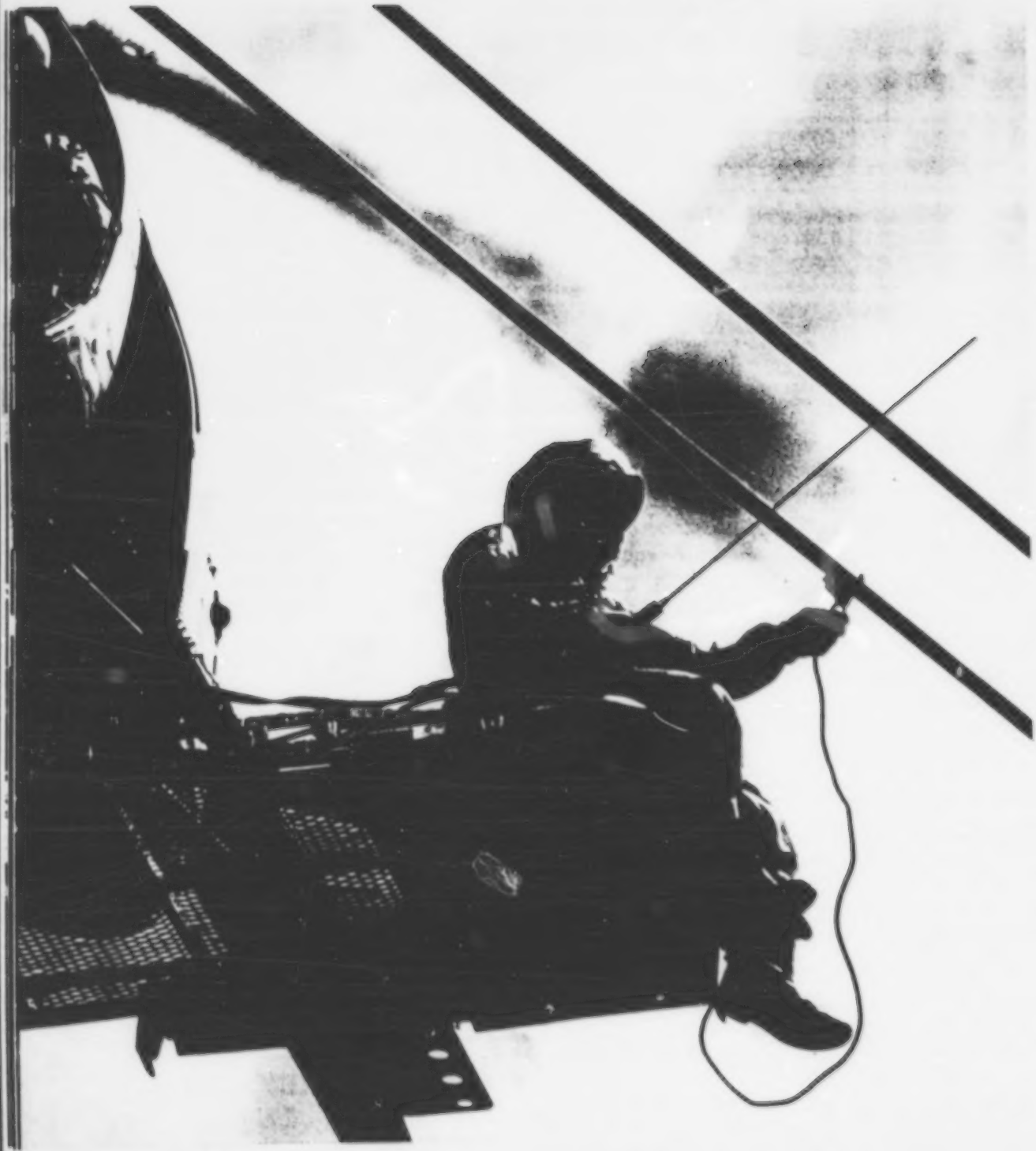
In addition to the project being ahead of schedule, its estimated cost has fallen over the course of the construction sequence, to $1.45 billion in 1990-91.

The ongoing reduction in cost reflects lower interest rates, lower escalation, and favorable tendering. The Limestone project is one of the most successful large construction projects in the Corporation's history.

With the additional power being transmitted to the Dorsey Converter Station from the Limestone Generating Station, additional reactive power compensation is required at Dorsey. The first of three synchronous condensers required for this purpose is now in service. The remaining synchronous condensers are expected to be in place next year.

MONITORING MEGAWATT OUTPUT: (Above) *Station operators at the Limestone Generating Station closely watch the output of the station's four units which came on line at the close of the fiscal year. The last of the station's 10 units is expected to come on line in November 1992.*

PRISTINE POWER: (Left) *The 1 330 megawatt Limestone Generating Station began contributing its first power to the provincial power grid in September, two and a half months ahead of schedule.*



TRANSMISSION AND STATIONS

Manitoba Hydro continues to upgrade and expand its transformer stations and transmission and distribution lines in order to meet increased customer demand and to improve reliability of service.

During 1990-91, the Corporation completed construction of a new station at Silver, along with a 60 kilometre 230-kilovolt transmission line. The line and station provide for load growth and a means of alleviating voltage problems in the Interlake area.

A new 47 kilometre 230-kilovolt transmission line is being constructed from the existing Reston Station to a new 230-66 kilovolt station to be built at Virden. The overall complex is scheduled for completion in the fall of 1991 and will provide facilities to handle load growth in western Manitoba and to relieve the overloaded 115-kilovolt system in the area.

In the past year, 49 projects involved work on improvements to distribution stations including a new station designed, constructed and placed in service at Beulah, and the rebuilding of existing stations at Amaranth and Pipestone.

REHABILITATION

Timely rehabilitation of generating and converter stations, dams and control structures enables Manitoba Hydro to continue the efficient operation of these resources and ensures that the expected useful lives of these facilities are reached or exceeded. The Corporation has in place long-term programs to ensure the appropriate maintenance of its facilities.

Rehabilitation work on the electrical and mechanical systems at the Seven Sisters, Great Falls, Pine Falls, Grand Rapids and Kelsey Generating Stations continued throughout the year. At the Kelsey Generating Station, a major overhaul of all the spillway gate roller paths is required due to extensive wear. Rehabilitation has been completed on one gate. Work on the remaining seven has been scheduled over the next four years.

Fire prevention and protection upgrading was performed at Great Falls, Seven Sisters, Jenpeg, Selkirk and Brandon Generating Stations.

The generation and delivery of power to Manitoba Hydro's customers involves an inevitable consumption of energy. A System Loss Monitoring Program in the System Control Centre computers now allows production efficiencies to be further improved.

During the year, loss monitoring equipment was installed in the Kettle Generating Station as part of a remote terminal unit for control monitoring.

Selkirk Generating Station's unit 2 was out of service at year-end. Inspections carried out last year indicated a possible crack in the shaft. The spindle will be reassembled during the 1991-92 fiscal year.

LABORATORY WORKS: (Above) A new chemistry lab, responsible for chemical analysis and environmental monitoring at the Selkirk Generating Station, opened in July. The lab will also be used by other areas of the Corporation including analysis of PCBs (polychlorinated biphenyls) in transformer oil, lubricating oil from the northern generating stations and water and asbestos studies.

WORLD FIRST FOR CHOPPER DC LINE MAINTENANCE: (Left) Closeup inspections of transmission line components and repairs on energized lines – including Manitoba Hydro's 500 kV direct current (DC) line, a world first for the procedure – were successfully carried out using a specially equipped helicopter from Haverfield Corporation. The work translates into increased system security and significant cost savings for the Corporation.

RESEARCH AND DEVELOPMENT AND UTILITY CONSULTING SERVICES

RESEARCH AND DEVELOPMENT

As an organization which relies heavily on a wide range of technologies, Manitoba Hydro's research and development activities reflect this broad requirement. Projects varying from research into environmental concerns to rehabilitation of reservoirs enables the Corporation to take advantage of emerging technologies and to make better use of existing ones.

Manitoba Hydro has established a research and development program designed to encourage innovation in areas that its business activities touch or are touched by. The utility is a major sponsor of the Manitoba HVDC Research Centre, allowing access to a knowledge base that is recognized as a world leader in high voltage direct current technology. A real-time digital simulator, relay test simulator and enhancements for these were among the projects sponsored by the Corporation at the Centre. Manitoba Hydro is also an active participant in the Canadian Electrical Association's Research and Development program and in Manitoba university projects where Manitoba Hydro and graduate students collaborate on projects of significance to the Corporation.

Among the projects instigated by Manitoba Hydro during the past year were: the development of pictographic warning signs for use in areas such as downstream of generating stations where dangers include fast water and slippery rocks; a study of the value of properties near transmission lines; various studies of ground source heat pumps; and house energy analysis.

Manitoba Hydro also participated in the research and development of highly sophisticated technologies related to the operation of hydraulic generating stations and transmission line design operations.

UTILITY CONSULTING SERVICES

Many developing countries that seek to improve their electricity systems have turned to Manitoba Hydro for assistance. The experience gained from developing and maintaining an advanced system enables the utility to respond to some of these requests, usually in conjunction with other utilities including Ontario Hydro, B.C. Hydro and Hydro-Quebec; engineering consultants including Teshmont Consultants Inc., Monenco, and Acres International and/or industry suppliers. Staff generally provide consulting services in the management and operation of electrical power systems.

Projects undertaken are generally funded by government-supported agencies. The Canadian International Development Agency (CIDA) is involved in the funding of work for Egypt, China, Zimbabwe and Honduras. The World Bank supports work in Tanzania and Lesotho. Services are offered on the basis of recovery of direct costs plus a margin for overhead and profit.

During the 1990-91 fiscal year, nine employees were stationed overseas for all or part of the year. A number of other staff members were involved either overseas or in Canada for periods ranging from a few hours to a few months. The cumulative involvement of staff totalled roughly 10 person years. During the year, Manitoba Hydro also hosted trainees from China, Japan and Australia.

SOLVING THE CASE OF THE WOODPECKER NESTS: Research into developing a method of restoring the structural rigidity of Western Red Cedar poles after woodpeckers have created nest holes was carried out by Manitoba Hydro. The experiment included using a product supplied by Multi-Industries of Winnipeg called Vultafoam which when poured into the nest hole, expands and fills the hole. Manitoba Hydro Forester Wade Munro assists Jim Anderson of Multi-Industries in pouring the foam into holes that can sometimes reach depths of two feet. Once the product is completely tested and proven, it will save the utility millions of dollars in pole replacement costs. A typical nesting habitat of woodpeckers is the 230-kilovolt woodpole gullport transmission line in the Whiteshell shown at left.

ELECTRICAL PRODUCTION

METERED ENERGY

During 1990-91, the energy generated by the 14 hydraulic generating stations in the integrated Manitoba system was 20.6 billion kilowatt hours, up 10.1 per cent from the 18.7 billion kilowatt hours generated in the 1989-90 year. The record annual hydraulic production in Manitoba was achieved four years ago when 24.0 billion kilowatt hours were generated.

The total amount of energy generated and imported during 1990-91 to meet the requirements of the Manitoba Integrated System and for power sold outside the province was 22.6 billion kilowatt hours, an increase of 5.3 per cent from the 21.5 billion kilowatt hours required in 1989-90.

Hydraulic generation amounted to 90.9 per cent of the total system supply compared to 86.9 per cent in 1989-90. The non-hydraulic portion of total supply was 1.3 per cent thermal and 7.8 per cent imports.

The stations on the Nelson River produced 67.1 per cent of the system supply compared to 63.2 per cent in 1989-90. The improvement was mainly due to 1.5 billion kilowatt hours of new generation becoming available from Limestone beginning in September 1990.

Generation from the Winnipeg River stations totalled 15.8 per cent of system supply, compared to 19.1 per cent generated in 1989-90. Above normal precipitation in the first three months of the year resulted in near optimal generation on the Winnipeg River until the end of August. Following below normal summer and fall precipitation, generation deteriorated through the fall and winter.

Generation at Grand Rapids on the Saskatchewan River was up 90.7 per cent from the previous year. Flows on the Saskatchewan River reached the long-term average in 1990-91 for the first time since 1986-87 and were the highest of the last 15 years.

Thermal generation required for energy supply and area voltage support during the year totalled 288.6 million kilowatt hours, down 33.2 per cent from the 432.3 million kilowatt hours generated last year. Brandon Generating Station produced 90.1 per cent of the total, while Selkirk Generating Station produced 9.9 per cent.

A total of 17.6 billion kilowatt hours of electricity were required to meet the needs of Manitoba Hydro customers during the year, an increase of 1.5 per cent from the 17.3 billion kilowatt hours required in 1989-90. The peak demand for electricity on the Manitoba system was recorded on December 20, 1990 when 3 586 megawatts was reached. This is a decrease of 1.2 per cent from last year's all-time high load of 3 631 megawatts reached on the same date and an increase of 5.3 per cent from the 1988-89 peak of 3 407 megawatts.

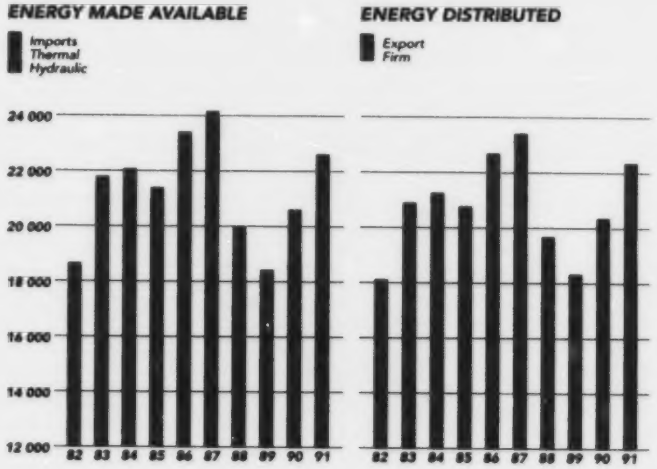
Manitoba Hydro continues to supply diesel-generated electricity to 13 communities not connected to the central supply grid. In 1990-91, the supply totalled 21.2 million kilowatt hours, up 1.6 per cent from the 20.9 million kilowatt hours provided in 1989-90.

SCHEDULED PURCHASES AND SALES

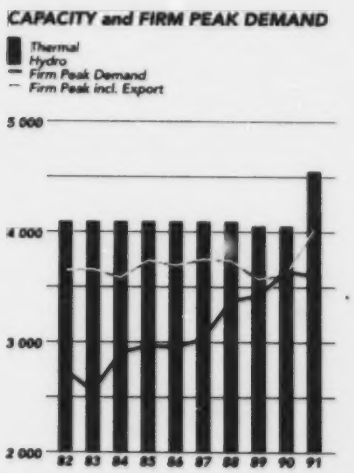
Imports of electricity during the year were down 44.5 per cent from the previous year, to 836.4 million kilowatt hours from 1.5 billion kilowatt hours. Purchases were 85.9 per cent from the U.S. with the remainder from Saskatchewan. Approximately 60 per cent of the energy purchased was resold for U.S. consumption with the remainder going to Ontario. The cost of purchases amounted to $10.5 million compared to $23.8 million in 1989-90.

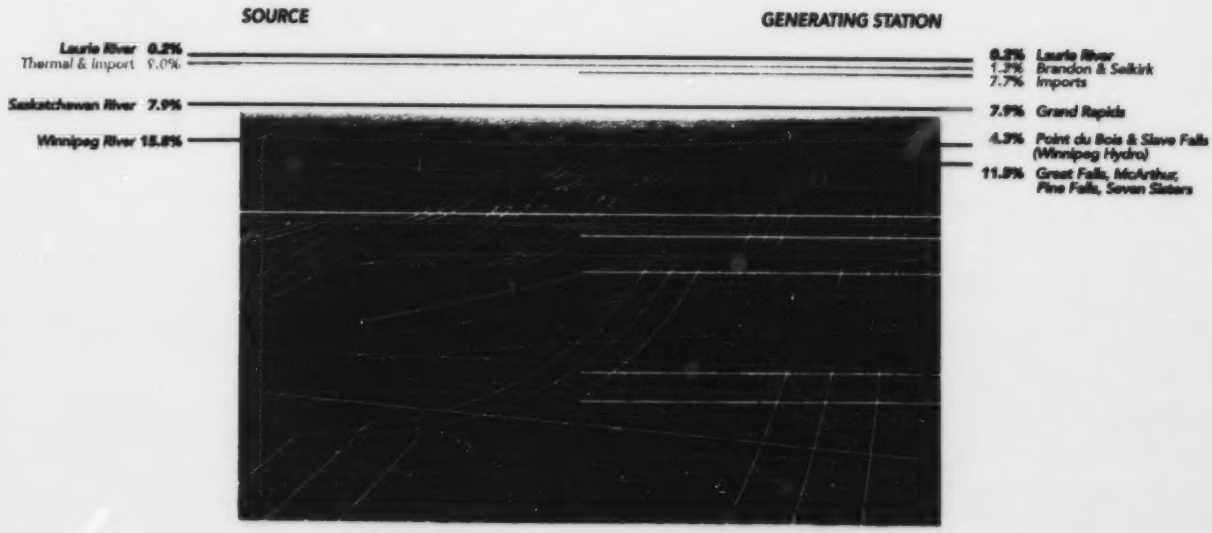
Sales of electricity outside the province amounted to 3.9 billion kilowatt hours, up 26.6 per cent from last year's sales. Revenue from sales of exports totalled $66.6 million compared to $60.1 million in 1989-90. Sales to Ontario accounted for 44.4 per cent of exports, the U.S. for 55.2 per cent and Saskatchewan for 0.4 per cent.

INTEGRATED SYSTEM 10 YEAR COMPARISON
GENERATION, PURCHASES AND SALES
in Millions of Kilowatt Hours for Fiscal Year Ended March 31



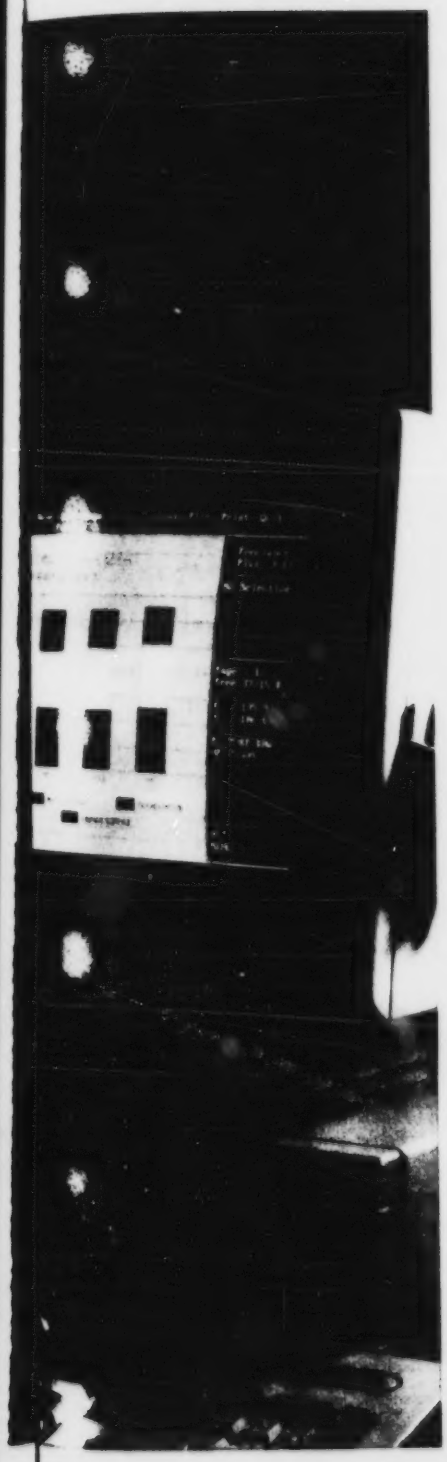
INTEGRATED SYSTEM 10 YEAR COMPARISON
CAPACITY AND FIRM PEAK DEMAND
in Thousands of Kilowatts for Fiscal Year Ended March 31





SOURCE OF ELECTRICAL ENERGY GENERATED AND PURCHASED
for Fiscal Year Ended March 31, 1991

FINANCIAL SECTION



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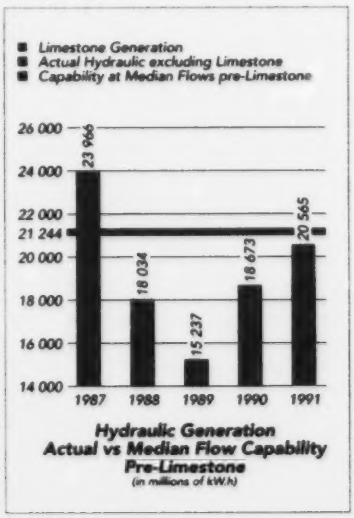
Net income for the year ended March 31, 1991 totalled $48.6 million compared to $24.2 million in the previous fiscal year. This is the second consecutive year that revenues have exceeded expenses and is the highest net income in the Corporation's history. The improvement in net income is primarily due to the financial impact of increased hydraulic generation and the average 4.0% general consumers rate increase implemented April 1, 1990. Corporate financial reserves have increased from $116.6 million at March 31, 1990 to $165.2 million at March 31, 1991 but continue to remain significantly lower than the minimum reserve target as set out in the Financial Objectives.

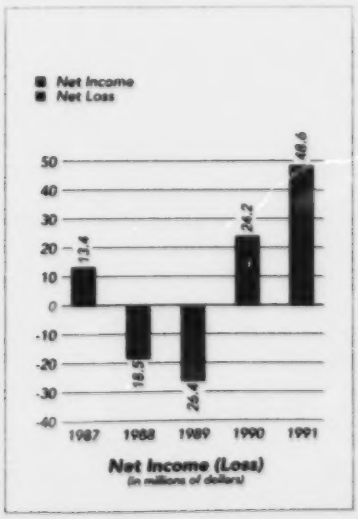
Although water flow conditions improved in the first quarter of the 1990-91 fiscal year, the dry weather conditions experienced during the summer and fall of 1990 resulted in lower than normal reservoir levels in the major drainage basins at freeze-up. Above average spring run-off and rains will be required to return water levels to near normal conditions in the 1991-92 fiscal year.

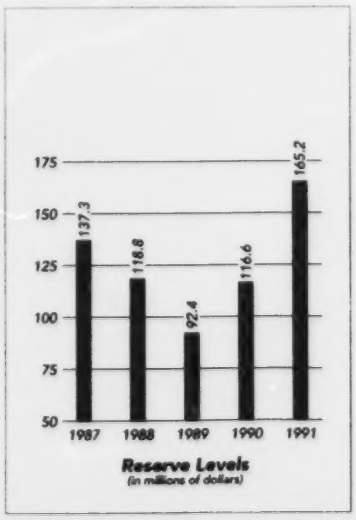
Total generation from the integrated system amounted to 20.9 billion kilowatt hours, an increase of 1.8 billion kilowatt hours over the previous fiscal year. Hydraulic generation for the year totalled 20.6 billion kilowatt hours, an increase of 10.1% or 1.9 billion kilowatt hours over 1989-90. The increase reflects an additional 1.5 billion kilowatt hours as a result of the commencement of operation of the first four units of the Limestone Generating Station during the 1990-91 fiscal year, and 0.4 billion kilowatt hours due to the marginal improvement in water flows. Despite the improvement during the 1990-91 fiscal year, total hydraulic including Limestone generation, remained approximately 0.7 billion kilowatt hours or 3.2% below normal pre-Limestone hydraulic capability. The additional hydraulic generation reduced the requirement for power purchases and thermal generation and increased the amount of surplus energy available for export.

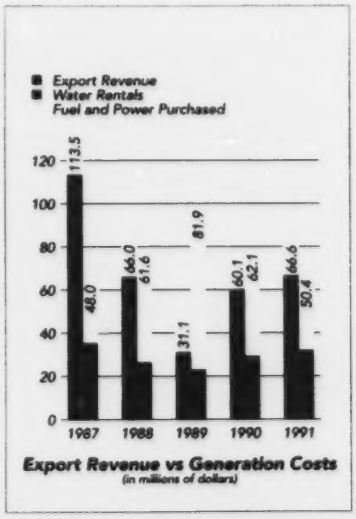
Corporate revenues increased by $38.4 million or 5.8% to $702.5 million. This reflects the rate increase implemented April 1, 1990 together with marginally higher consumption of electricity by Manitoba Hydro general consumers and an increase in extraprovincial sales.

Total expenses rose by $14.0 million to $653.9 million, or 2.2% higher than last year. Increases in finance expense, depreciation and water rentals were primarily associated with the commencement of operation of the first units of the Limestone Generating Station. These increases, combined with higher operating and administrative costs, were partially offset by lower fuel and power purchased costs resulting from improved hydraulic generation.









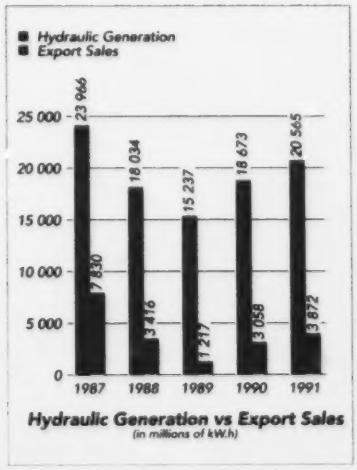
REVENUES

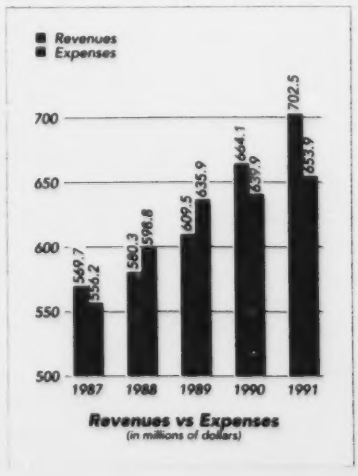
Sale of Power - Manitoba

Sales of electricity to Manitoba Hydro general consumers increased from 12.9 billion kilowatt hours in 1989-90 to 13.0 billion kilowatt hours in 1990-91. Although weather conditions were comparable to the 1989-90 fiscal year, the increase in consumption was only 0.9% reflecting the downturn in the economy experienced during the year. The marginal increase in energy consumption combined with the 4.0% rate increase implemented April 1, 1990 resulted in general consumers revenue increasing by $28.6 million to $578.0 million. Net energy supplied to Winnipeg Hydro increased to 1.6 billion kilowatt hours in 1990-91 from 1.5 billion kilowatt hours in 1989-90 due to a decrease in generation from their hydraulic system. Revenue of $50.1 million from Winnipeg Hydro under the terms of the cost sharing agreement combined with Manitoba Hydro general consumers revenue resulted in total revenues from Manitoba customers of $628.1 million, an increase of 5.2% over the previous fiscal year.

Sale of Power - Extraprovincial

Energy sold to utilities outside of Manitoba increased by 26.6% from 3.1 billion kilowatt hours to 3.9 billion kilowatt hours in 1990-91 as a result of additional hydraulic generation. Revenue from these sales totalled $66.6 million compared to $60.1 million in the previous fiscal year. The average selling price decreased from 1.97 cents to 1.73 cents per kilowatt hour mainly due to the greater amount of energy available for export.





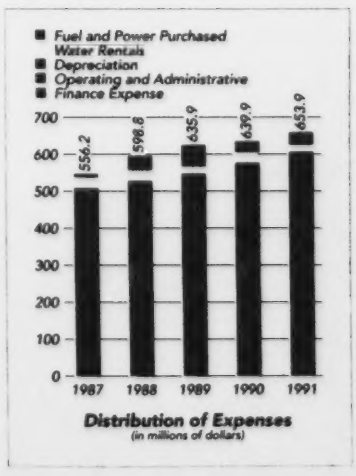
EXPENSES

Finance Expense

Finance expense amounted to $256.6 million in 1990-91 as compared to $242.0 million in 1989-90. The increase of $14.6 million is primarily due to the carrying costs associated with the commencement of the operation of the first units of the Limestone Generating Station during the year and an increase in the Provincial Guarantee Fee on Corporate borrowing from 1/8 to 1/4 of 1.0%. These increases were partially offset by lower interest payments as a result of favorable interest rates and the improvement in the value of the Canadian dollar in relation to the U.S. dollar.

Operating and Administrative

Operating and administrative costs increased by $5.6 million or 2.3% to $253.9 million in 1990-91. The increase was the result of higher pension costs of $1.4 million with the balance due to increased costs associated with the operation, maintenance and administration of the utility.



EXPENSES

Depreciation

Depreciation charges rose by $5.4 million to $93.0 million in 1990-91. The part-year addition of the first units of the Limestone Generating Station and its related facilities accounted for a $2.9 million increase with the balance due to additions to other generation, transmission, substation, distribution and general plant.

Water Rentals

Water rental costs amounted to $32.6 million, an increase of $3.7 million over 1989-90. This increase was due to higher levels of hydraulic generation and the full-year impact of the increase in water rental rates from $8.96 to $9.90 per horsepower-year effective September 1, 1989.

Fuel and Power Purchased

Fuel and power purchased costs decreased 46.3% to $17.8 million in 1990-91 from $33.2 million in 1989-90. The $15.4 million reduction was due to the additional hydraulic generation provided by the addition of the first units of the Limestone Generating Station and marginally better water flow conditions during the year. The increased hydraulic generation enabled the Corporation to reduce its purchases of power from utilities outside the province and also resulted in lower fuel costs as the requirement for thermal generation was reduced.

CAPITAL EXPENDITURES

Capital Expenditures

Additions to fixed assets for the 1990-91 fiscal year were $440.2 million compared to $426.9 million in 1989-90. Capital expenditures of $250.1 million were incurred on the Limestone Generating Station and related system requirements. Other capital expenditures included costs associated with the settlement of outstanding responsibilities related to the development of the Grand Rapids Generating Station. The settlement agreements concluded during the year provided for compensation payments totalling $21.1 million to the Chemawawin First Nation and the community of Easterville, and the Moose Lake Band of Indians and the community of Moose Lake. A further $7.0 million was spent for mitigation of the environmental, economic and social impacts of the Lake Winnipeg Regulation and Churchill River Diversion projects. Approximately $35.3 million was spent on other major generation and transmission facilities. The balance of the capital expenditures were incurred for other additions, modifications and service extensions throughout the province.

Limestone Generating Station

Excellent progress was made during the year on the Limestone Generating Station, with commissioning of the first four units taking place between September 1990 and the end of March 1991. The remaining six units are scheduled to be placed in-service over the next two fiscal years with three units in each of the years. The latest approved total estimated cost of this generating station is $1.451 billion with $1.279 billion being spent to March 31, 1991. The Limestone Generating Station will provide a net capacity addition of 1 330 megawatts to the system when it becomes fully operational in 1992.

FINANCING

Financing

The Corporation utilizes cash from both operations and external borrowing to finance capital construction. Cash provided by operating activities during the year was $158.2 million (1989-90 - $152.2 million). During the year the Corporation arranged $760.5 million of new borrowing net of discount and commissions (1989-90 - $486.5 million). Of this borrowing, $694.7 million was arranged through the Province of Manitoba with the remainder being raised primarily through the issue of Manitoba Hydro Savings Bonds - Series 2. Debt maturities during the year amounted to $396.9 million (1989-90 - $282.4 million).

Exposure Management Program

The Corporation actively manages and limits the potential adverse financial impact of U.S. dollar fluctuations through its exposure management program. The program strategies specifically address U.S. dollar exposure by entering into U.S. dollar financing, U.S. dollar investments and other monetary agreements. These effectively offset the U.S. dollar debt payments with the U.S. dollar export revenues and also limit the annual increase or decrease in net U.S. dollar exposure within defined program limits.

FINANCING

Manitoba Hydro Savings Bonds

On April 24, 1990 the Minister of Finance announced the second issue of Manitoba Hydro Savings Bonds. HydroBonds were issued as both annual interest and monthly interest bonds and were purchased by 21 000 Manitobans, providing $65.4 million for general Corporate purposes.

The 1990 issue, which matures June 15, 1993, has a guaranteed annual interest rate of 12.25% (11.61% monthly) for the first year, 9.25% (8.88% monthly) for the second year and a minimum guaranteed annual interest rate of 9.0% (8.65% monthly) for the third year. The bonds are redeemable at par plus interest for a one week period in December and June of each year prior to maturity.

A third series of Manitoba Hydro Savings Bonds is being offered for sale exclusively to Manitobans commencing May 21, 1991. The bonds are available on either a monthly interest basis, annual interest basis or compounded over the five year term. Interest on this series is set at a guaranteed annual rate of 9.25% (8.88% monthly) for the first year and a minimum guaranteed annual rate of 8.0% (7.72% monthly) for the remaining four years.

THE PUBLIC UTILITIES BOARD

Rate Review

In November 1990, the Corporation applied to The Public Utilities Board for approval of a three year rate increase proposal with successive incremental revenue increases of $27.0 million, $28.7 million and $27.3 million which approximated 4.5%, 4.5% and 4.0% increases in general consumers revenue to be implemented April 1, 1991, 1992 and 1993 respectively.

On March 20, 1991, The Public Utilities Board in its Order No. 29/91 directed the Corporation to reduce its proposed rate increase by 1.0% for the 1991-92 fiscal year and disallowed Manitoba Hydro's application for rate increases effective April 1, 1992 and 1993 on the basis that public interest in periodic reviews outweighed any cost savings that would occur as a result of a multi-year rate approval. The revised 3.5% average rate increase, to be implemented effective April 1, 1991, is expected to generate additional revenue of approximately $20.9 million for the 1991-92 fiscal year or $6.1 million less than the Corporation proposed.

FINANCIAL OBJECTIVES

Financial Objectives

The Corporation has established financial targets with the objective of enhancing its financial strength which will contribute to rate stability and predictability and protect the Corporation and its customers from a variety of risks.

Specific financial targets together with an implementation schedule have been adopted by the Corporation and have been identified as follows:

The short-term financial objective is defined as achievement of minimum reserves sufficient to withstand the financial effects of two years of drought equal to the worst on record plus a provision for the maximum third-party loss the Corporation could incur under its self-insurance program. A target date of 1994-95 has been set for the attainment of minimum reserves totalling $370 million.

The long-term objective is to attain and maintain an 85:15 debt/equity ratio within ten years of 1994-95. In moving towards this goal the Corporation will attempt to maintain a gross interest coverage in the 1.15 to 1.25 range. In the interest of rate stability, the gross interest coverage target may be deviated from immediately prior to and during the periods in which new major capital facilities are being absorbed into the rate base. Interest coverage for 1990-91 was 1.11 compared to 1.06 in 1989-90. The Corporation's debt/equity ratio improved from 97:03 at March 31, 1990 to 96:04 at March 31, 1991.

MANAGEMENT REPORT

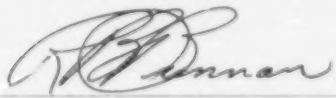
The accompanying financial statements are the responsibility of management and have been prepared in accordance with generally accepted accounting principles as established in Canada. These principles have been applied on a basis consistent with that of the preceding year. In management's opinion the financial statements have been properly prepared within reasonable limits of materiality, incorporating management's best judgement regarding all necessary estimates and all other data available up to June 3, 1991. The financial information presented elsewhere in the Annual Report is consistent with that in the financial statements.

Management maintains internal controls to provide reasonable assurance of the reliability and accuracy of the financial information and that the assets of the Corporation are properly safeguarded. An internal audit function independently evaluates the effectiveness of these internal controls on an ongoing basis and reports its findings to management and to the Audit Committee of the Board.

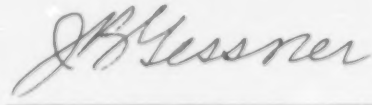
The responsibility of the external auditors, Peat Marwick Thorne, is to express an independent, professional opinion on whether the financial statements are fairly presented in accordance with generally accepted accounting principles. The Auditors' Report outlines the scope of their examination and their opinion.

The Audit Committee of the Board meets with representatives of the external auditors, the internal auditors and management to satisfy itself that each group has properly discharged its respective responsibility and to review the financial statements before recommending approval by the Board. The Board has reviewed the Annual Report in advance of its release and has approved its content and authorized its publication.

On behalf of Management:



R. B. Brennan, C.A.
President and Chief Executive Officer



J. B. Gessner, C.M.A.
Vice-President Finance and Chief Financial Officer

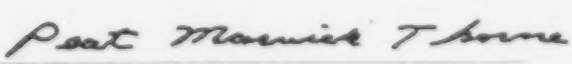
AUDITORS' REPORT

To The Manitoba Hydro-Electric Board

We have audited the balance sheet of The Manitoba Hydro-Electric Board as at March 31, 1991 and the statements of operations, reserves and changes in financial position for the year then ended. These financial statements are the responsibility of the Corporation's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the Corporation as at March 31, 1991 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles.



Chartered Accountants
Winnipeg, Canada
June 3, 1991

STATEMENT OF OPERATIONS
FOR THE YEAR ENDED MARCH 31, 1991 (with 1990 figures for comparison)

	1991	1990
	(thousands of dollars)	
REVENUES		
Sale of power		
Manitoba	$ 628 090	$ 596 915
Extraprovincial	66 551	60 089
Other revenue	7 858	7 084
	702 499	664 088
EXPENSES		
Operating and administrative	253 935	248 312
Depreciation-plant	92 997	87 572
Water rentals (Note 2)	32 587	28 855
Fuel and power purchased	17 843	33 209
	397 362	397 948
Net income before finance expense	305 137	266 140
FINANCE EXPENSE (Note 3)	256 577	241 943
NET INCOME	$ 48 560	$ 24 197

The accompanying notes are an integral part of the financial statements.

BALANCE SHEET
AS AT MARCH 31, 1991 (with 1990 figures for comparison)

ASSETS	1991	1990
	(thousands of dollars)	
FIXED ASSETS (Note 4)		
In service	$ 4 521 947	$ 3 748 338
Less: Accumulated depreciation	1 152 873	1 071 602
	3 369 074	2 676 736
Construction in progress	897 865	1 206 202
	4 266 939	3 882 938
CURRENT ASSETS		
Temporary investments	362 500	204 000
Accounts receivable	102 813	77 979
Accrued revenue and interest receivable	36 341	33 197
Materials and supplies, at average cost	41 461	39 418
	543 115	354 594
OTHER ASSETS		
Deferred pension expense	146 264	170 416
Deferred expenses and advances (Note 5)	249 753	286 591
	396 017	457 007
	$ 5 206 071	$ 4 694 539

Approved on behalf of the Board:

John A. McCallum — Chairman

D. Wildmand — Vice-Chair

LIABILITIES AND RESERVES	1991	1990
	(thousands of dollars)	
LONG-TERM DEBT (Note 6)	$ 3 884 719	$ 3 556 626
CURRENT LIABILITIES		
Bank balances	141 080	130 177
Accounts payable and accrued liabilities	101 704	103 883
Notes payable, due within one year	119 492	–
Accrued interest	116 433	100 070
Current portion of long-term debt (Note 6)	314 601	331 811
	793 310	665 941
DEFERRED LIABILITIES (Note 7)	30 337	26 543
PENSION OBLIGATIONS (Note 8)	219 518	218 706
DEFERRED CREDITS (Note 9)	113 052	110 148
RESERVES (Note 11)	165 135	116 575
	$ 5 206 071	$ 4 694 539

The accompanying notes are an integral part of the financial statements.

STATEMENT OF RESERVES
FOR THE YEAR ENDED MARCH 31, 1991 (with 1990 figures for comparison)

			1991	1990
			(thousands of dollars)	
	Contingency and General	Rate Stabilization	Total	Total
BALANCE–BEGINNING OF YEAR	$ 137 277	$ (20 702)	$ 116 575	$ 92 378
Net income transferred from operations	–	48 560	48 560	24 197
BALANCE–END OF YEAR	$ 137 277	$ 27 858	$ 165 135	$ 116 575

The accompanying notes are an integral part of the financial statements.

STATEMENT OF CHANGES IN FINANCIAL POSITION
FOR THE YEAR ENDED MARCH 31, 1991 (with 1990 figures for comparison)

	1991	1990
	(thousands of dollars)	
OPERATING ACTIVITIES		
Cash from operations		
Net income	$ 48 560	$ 24 197
Depreciation-plant	92 997	87 572
Amortization of debt discount and expense	8 803	8 771
Amortization of foreign exchange	(181)	516
Realized foreign exchange gain	–	(643)
Pension expense	24 964	24 928
Other	(1 334)	(3 474)
Non-cash working capital change	(15 620)	10 298
Cash provided by operating activities	158 189	152 165
FINANCING ACTIVITIES		
Proceeds from long-term debt	760 520	486 529
Retirement of long-term debt	(396 887)	(282 419)
Contributions and advances in aid of construction	9 260	17 284
Increase (decrease) in notes payable	119 492	(109 287)
Sinking fund payment	(57 140)	(54 313)
Other	(372)	3 217
Cash provided by financing activities	434 873	61 011
INVESTING ACTIVITIES		
Additions to fixed assets	(440 173)	(426 922)
Other assets	(5 292)	(15 347)
Cash used in investing activities	(445 465)	(442 269)
INCREASE (DECREASE) IN CASH	147 597	(229 093)
CASH AT BEGINNING OF YEAR	73 823	302 916
CASH AT END OF YEAR	$ 221 420	$ 73 823

The components of cash are bank balances and temporary investments.

The accompanying notes are an integral part of the financial statements.

NOTE 1 - SIGNIFICANT ACCOUNTING POLICIES

The financial statements have been prepared in accordance with generally accepted accounting principles as established in Canada.

a) Fixed Assets

Fixed assets are stated at cost which consists of contracted services, direct labor, material and expense, a proportionate share of overhead costs and interest applied at the effective rates incurred in financing construction. Finance expense is allocated to construction until a facility becomes operational or a decision is made to abandon, cancel or indefinitely defer construction. The cost of plant removed plus removal costs less salvage value is charged to accumulated depreciation.

Main facilities of major projects under construction become operational on a progressive basis. As such facilities become operational, related construction costs and a pro rata share of related common properties are transferred to plant in service. Once the transfer to plant in service is made, finance expense allocated to construction ceases and depreciation and finance expense charged to operations commences.

Depreciation is provided on a straight-line remaining life basis. The major components of generating stations are depreciated over the lesser of the remaining life of the major component or the remaining life of the associated generating station.

The range of the estimated service lives of components within each major asset category is as follows:

Hydroelectric generation	40 - 100 years
Thermal-electric generation	35 - 45 years
Transmission lines and stations	20 - 80 years
Distribution lines	10 - 60 years

b) Foreign Exchange:

Long-Term Debt

The translation of foreign long-term debt and the extent to which Manitoba Hydro is responsible for the resulting translation gains or losses has been established by The Energy Rate Stabilization Act. The Act, including the amendments of April 1, 1987 and April 1, 1989, set out the Corporation's obligations on foreign long-term debt as follows:

i) United States Debt

The impact of foreign exchange fluctuations associated with United States debt has been essentially eliminated through the Corporation's exposure management program which became effective April 1, 1989. Under this program, United States denominated debt is offset against contracted future United States revenue. Accordingly, United States debt transacted prior to April 1, 1989 is translated at the book value in effect at April 1, 1989 after taking into account, where applicable, the Province of Manitoba's obligation under The Energy Rate Stabilization Act for foreign exchange gains or losses and the amortization of unrealized foreign exchange gains or losses recorded by the Corporation to March 31, 1989. The Province of Manitoba's obligation, which is recorded as a deferred expense, amounts to $182.8 million (1990 - $183.3 million). United States debt transacted after April 1, 1989 is translated at the rate of exchange in effect at the date of issue. United States debt fixed by foreign exchange contract is recorded at the contracted rate.

ii) Foreign Debt Other Than United States Debt

Foreign long-term debt other than United States debt is translated into Canadian currency at rates of exchange prevailing at the date of the balance sheet, or in the case of debt fixed by foreign exchange contracts, at the contracted rate. Unrealized foreign exchange gains or losses net of the Province's obligation under The Energy Rate Stabilization Act as at March 31, 1991 are amortized on a straight-line basis over the remaining life of the related debt and together with realized exchange gains or losses are credited or charged to operations.

Current Assets and Current Liabilities
Current monetary assets and liabilities denominated in foreign currencies, with the exception of the current portion of long-term debt, are translated into Canadian currency at rates of exchange prevailing at the date of the balance sheet. The unrealized exchange gains or losses together with realized exchange gains or losses are credited or charged to operations. The current portion of long-term debt is translated in the same manner as long-term debt.

Sinking Fund Investments
Sinking fund investments denominated in foreign currencies are translated into Canadian currency at the rates of exchange prevailing at the date of the balance sheet, except where the investments have been fixed through monetary contracts by the Minister of Finance of the Province of Manitoba, in which case the contracted rate confirmed by the Province is used in the translation. The unrealized exchange gains or losses are amortized on a straight-line basis over the remaining life of the investment and together with realized exchange gains or losses are credited or charged to operations.

United States Contracted Revenue
Under the exposure management program, future contracted United States revenues have been designated as an offset against United States debt. These revenues will be translated at the book value of the associated United States debt.

Other Transactions
Expense and revenue transactions made in foreign currencies are translated into Canadian currency at the rates of exchange prevailing at the date of the transaction, except transactions covered by monetary contracts which are translated into Canadian dollars at the rates of exchange established by the contracts.

c) Pension Plans
The costs of pension benefits are determined periodically by independent actuaries using the accrued benefit method and management's best estimate assumptions. Pension expense is charged to operations and is comprised of the cost of pension benefits provided in exchange for employees' services rendered during the year, amortization of the cost of past service benefits, interest equivalent on the unfunded pension liability as at the beginning of the year and amortization of experience gains and losses resulting from actuarial revaluations.

The present value of past service benefits and actuarially determined experience gains or losses, to the extent not previously charged to operations, is recognized in the financial statements as a deferred pension expense and is amortized on a sinking fund basis over the expected average service lives of the employees covered by the plans.

d) Debt Discount and Expense
These costs are amortized to finance expense on a straight-line basis over the life of the respective issue.

e) Discount on Sinking Fund Investments
The Corporation records sinking fund investments at par value. The difference between the cost and the par value of the investments is recorded as a premium or discount and is amortized on a straight-line basis over the remaining life of the investment. Any gain or loss on early disposal is credited or charged to operations.

f) Planning Studies Costs
These costs are recorded as a deferred expense and are amortized to depreciation expense on a straight-line basis over a 15 year period. The balance of the unamortized costs of a project which proceeds during the 15 year period are transferred to the capital cost of the project.

g) Unbilled Revenue
Revenues are accrued in respect of electricity delivered for those cycles not yet billed.

NOTE 2 - WATER RENTALS

Rentals in the amount of $32 587 thousand (1990 - $28 855 thousand) were paid to the Province of Manitoba for the use of water and land for purposes of hydraulic generation.

NOTE 3 – FINANCE EXPENSE

	1991	1990
	(thousands of dollars)	
Interest on debt	$ 428 328	$ 404 212
Amortization of debt discount and expense	8 803	8 771
Amortization of foreign exchange gains or losses	(181)	516
Finance expense allocated to construction	(109 834)	(97 465)
Investment income	(70 539)	(74 091)
	$ 256 577	$ 241 943

Included in interest on debt is $10 010 thousand (1990 - $4 940 thousand) in respect of the Provincial Guarantee Fee. This fee is calculated at 1/4 of 1% (1990 - 1/8 of 1%) of the total outstanding debt guaranteed by the Province as at the preceding year end.

NOTE 4 – FIXED ASSETS (at cost)

	1991		
	Original Cost	Accumulated Depreciation	Construction in Progress
		(thousands of dollars)	
Generation	$ 2 543 398	$ 515 825	$ 775 160
Transmission	273 889	79 625	11 586
Substations	829 062	252 424	81 934
Distribution	670 769	227 249	18 202
Other	204 829	77 750	10 983
	$ 4 521 947	$ 1 152 873	$ 897 865

Construction in Progress includes $698 176 thousand (1990 - $1 070 353 thousand) in respect of the Limestone Generating Station. During the year four of the ten units of the Limestone Generating Station commenced operation.

	1990		
	Original Cost	Accumulated Depreciation	Construction in Progress
		(thousands of dollars)	
Generation	$ 1 916 399	$ 485 225	$ 1 092 927
Transmission	256 927	75 113	16 088
Substations	768 826	229 450	72 980
Distribution	631 968	210 112	11 001
Other	174 218	71 702	13 206
	$ 3 748 338	$ 1 071 602	$ 1 206 202

NOTE 5 - DEFERRED EXPENSES AND ADVANCES

	1991	1990
	(thousands of dollars)	
Amounts receivable from the Province under The Energy Rate Stabilization Act	$ 184 367	$ 185 595
Unamortized bond discount and expense	27 326	29 473
Unamortized planning study costs	19 424	53 635
Advance to the Northern Flood Committee Inc. (Note 10b)	4 312	4 514
Advance to the Split Lake Cree First Nation (Note 10b)	2 500	-
Deferred receivables	6 344	6 405
Unamortized foreign exchange net loss on long-term debt	-	419
Other	5 480	6 550
	$ 249 753	$ 286 591

NOTE 6 - LONG-TERM DEBT

Manitoba Hydro's long-term debt is either advanced from or guaranteed by the Province of Manitoba.

As provided by The Manitoba Hydro Act, the Corporation pays an annual sinking fund installment to the Minister of Finance of the Province of Manitoba of not less than 1% of the principal amount of the outstanding long-term debt on the preceding March 31, and 4% of the balance in the sinking fund at such date. Such installments would provide for the full retirement of a debt obligation only if the obligation was outstanding for 41 years. Income earned on sinking fund investments is remitted to the Corporation and is included with investment income for the year.

For the purpose of financing capital construction expenditures and repaying debt during the year, the Corporation arranged long-term financing in the principal amount of $768.8 million (1990 - $494.6 million) as follows:

- $65.4 million Manitoba Hydro Savings Bonds Series 2 due June 15, 1993 with interest at 12.25% during the first year and a minimum rate of 9% for the remaining two years. The bonds are subject to redemption semi-annually until maturity at the option of the bondholder.
- $403.4 million (U.S. $350.0 million) advance from the Province of Manitoba due October 1, 2000 with an interest rate of 9.5%.
- $300.0 million advance from the Province of Manitoba due March 5, 2031 with an interest rate of 10.5%. Debenture purchase warrants were issued in conjunction with the debt issue which provide the holder the option to purchase an equal amount of this issue at any time up to March 5, 1992 at the issue price.

Long-Term Debt:

	1991	1990
	(thousands of dollars)	
Total long-term debt outstanding –		
The Manitoba Hydro-Electric Board Bonds	**$ 1 173 262**	$1 192 843
Advances from the Province of Manitoba represented by debenture debt of the Province	**3 124 429**	2 707 653
Manitoba Hydro Savings Bonds	**228 048**	286 086
Advances from the Province of Manitoba under a loan agreement between the Province and Canada	**130 618**	131 246
	4 656 357	4 317 828
Less: Sinking fund on deposit with the Minister of Finance	**457 037**	429 391
	4 199 320	3 888 437
Less: Long-term debt maturing within one year – Maturities net of sinking fund plus annual sinking fund installment	**314 601**	331 811
	$ 3 884 719	$3 556 626

Debt Maturities:

			Cash Requirements (thousands of dollars)		
Years	**Principal Amount of Maturities**	**Weighted Average Coupon Rate**	**Maturities Net of Sinking Fund**	**Annual Sinking Fund Installments**	**Total**
1992	$ 298 232	9.34%	$ 252 921	$ 61 680	**$ 314 601**
1993	918 547	10.24%	814 967	59 360	**874 327**
1994	220 554	8.73%	170 077	48 418	**218 495**
1995	265 727	8.81%	199 667	46 299	**245 966**
1996	27 994	9.56%	20 978	43 109	**64 087**
	1 731 054	9.66%	1 458 610	258 866	**1 717 476**
1997 - 2001	1 572 649	8.81%	1 339 985	190 091	**1 530 076**
2002 - 2006	622 893	9.13%	337 378	121 028	**458 406**
2007 - 2011	174 036	8.74%	86 566	61 873	**148 439**
2012 - 2016	5 202	10.00%	3 117	67 939	**71 056**
2017 - 2031	550 523	10.11%	124 741	182 405	**307 146**
	$ 4 656 357	9.32%	$ 3 350 397	$ 882 202	**$ 4 232 599**

Currency In Which Payable:

	1991	1990
	(thousands of Canadian dollars)	
Canadian dollars	$1 841 509	$1 885 907
United States dollars	2 806 787	2 424 104
Swiss francs	8 061	7 817
	$4 656 357	$4 317 828

Debt denominated in United States currency is not subject to foreign exchange fluctuations as book value rates have either been fixed by the exposure management program's offset strategy, or have been fixed according to monetary contracts.

United States debt in the amount of Canadian $2 747 287 thousand is recorded at book value as established by the Corporation's exposure management program. In addition Canadian $59 500 thousand of United States debt has been fixed according to monetary contracts.

If United States debt recorded at book value rates as established by the exposure management program had been translated at the exchange rate prevailing at the balance sheet date ($1.00 United States = $1.1587 Canadian), the total obligation would have decreased by Canadian $86 772 thousand from Canadian $4 656 357 thousand to Canadian $4 569 585 thousand.

Swiss franc debt in the amount of Canadian $4 080 thousand has been fixed according to monetary contracts. A portion of the foreign exchange gains or losses on Swiss debt is the responsibility of the Province of Manitoba.

NOTE 7 – DEFERRED LIABILITIES

	1991	1990
	(thousands of dollars)	
Liabilities in respect of employee benefits:		
- Vested sick leave	$12 403	$10 966
- Banked vacation entitlement	5 525	4 422
- Long-term disability	2 195	1 883
- Severance benefits and other	1 605	1 445
	21 728	18 716
Refundable advances from customers	8 219	7 294
Capital lease obligations	390	533
	$30 337	$26 543

NOTE 8 – PENSION OBLIGATIONS

Manitoba Hydro employees are eligible for pensions under the Manitoba Civil Service Superannuation Fund. This fund is a defined benefit plan which requires the Corporation to contribute 50% of the pension disbursements made to retired employees. In addition, the Manitoba Hydro Retirement Plan continues to provide benefits to pensioners in respect of service prior to the date each employee entered the Manitoba Civil Service Superannuation Fund.

Actuarial valuations are carried out every three years and provide an estimate of the accrued pension benefits. The most recent actuarial valuations for the Manitoba Civil Service Superannuation Fund and Manitoba Hydro Retirement Plan were performed as at December 31, 1989 and March 31, 1991 respectively. These valuations incorporate management's best estimate assumptions which take into consideration the long-term nature of the pension plans.

Based on these assumptions, the actuarial present value of the unfunded accrued pension benefits (Note 12) is estimated to be $219.5 million as at March 31, 1991 (1990 - $218.7 million based on assumptions used at that time).

Pension expense for the year ended March 31, 1991 was $32.9 million based on the latest actuarial valuations (1990 - $31.7 million).

NOTE 9 - DEFERRED CREDITS

	1991	1990
	(thousands of dollars)	
Non-refundable capital contributions	**$ 100 931**	$ 97 053
Unamortized discount on purchase of sinking fund investments	**9 422**	10 616
Deferred interest income	**2 332**	1 880
Unamortized foreign exchange on sinking fund investments	**187**	491
Unamortized foreign exchange net gain on long-term debt	**66**	–
Other	**114**	108
	$ 113 052	$ 110 148

NOTE 10 - COMMITMENTS

a) Lease Commitments

In accordance with a lease agreement entered into during 1966 between Canada and the Province of Manitoba, direct current transmission facilities were constructed between the Kettle Generating Station and Winnipeg. The agreement provides for payment by the Corporation of the capital cost with accrued interest at 5.625% over a term of forty-five years in accordance with a payment schedule which required substantially smaller payments during the earlier years. The schedule provides for payment of $25 852 618 for the year ended March 31, 1991 (1990 - $25 852 618). Payments for the fiscal years 1992 to 2019 are calculated as an equal annual payment of $25 852 618 in order to amortize the outstanding balance over thirty years at 5.625%. The unpaid balance of principal plus accrued interest for transmission facilities amounted to approximately $358 620 000 as at March 31, 1991 (1990 - $363 885 000).

The Corporation's policy is to charge the lease payments to operations in the period in which they become payable. This policy is consistent with the intent of the lease agreement of providing economic relief to ratepayers during the early years of the Nelson River development. This economic relief has been realized and operations are now bearing lease payments which are in excess of the amount that would have been charged to operations had the Corporation adopted the C.I.C.A. recommendation on accounting for those capital leases entered into subsequent to January 1, 1979. If the C.I.C.A. recommendation had been adopted, the amount charged to operations for the year would have been reduced by $0.4 million and an additional net asset amount of approximately $158.8 million would have been recorded relating to the transmission facilities.

b) Mitigation Commitments

i) Churchill River Diversion & Lake Winnipeg Regulation Projects

a) Northern Flood Agreement

Manitoba Hydro is party to an agreement dated December 16, 1977 with Canada, the Province of Manitoba and the Northern Flood Committee Inc., which includes compensation and mitigation for the impact of the Churchill River Diversion and Lake Winnipeg Regulation projects. The total spent on compensation and mitigation during the year was $6.6 million (1990 - $11.0 million). A provision for the construction of a weir at Cross Lake is included in construction commitments. The total amount paid to March 31, 1991 under the Northern Flood Agreement is $54.3 million.

In addition to the above, in 1987 Manitoba Hydro advanced $5.0 million to the Northern Flood Committee Inc. to provide funds to the Indian Bands for their use in housing upgrading. This advance, adjusted for the time value of the advance, will reduce the amounts payable for future adjudicated claims. The balance of the advance at March 31, 1991 is $4.3 million.

Negotiations between Manitoba Hydro, Canada, the Province of Manitoba and the Northern Flood Committee Inc. directed towards a global settlement of outstanding obligations were unsuccessful. Manitoba Hydro has reverted to settlement of individual claims on an arbitrated or negotiated basis and has estimated its contingent liability to the five Bands of the Northern Flood Committee Inc. to be in excess of $60.0 million. Manitoba Hydro, Canada, and the Province of Manitoba are pursuing a potential settlement with one of the five Bands (Split Lake Cree First Nation). Manitoba Hydro has advanced $2.5 million to the Split Lake Cree First Nation against the proposed basis of settlement with this Band.

b) Non-Northern Flood Agreement Claims

During the year, Manitoba Hydro paid $0.5 million towards settlement of non-Northern Flood Agreement claims. These claims are submitted directly to Manitoba Hydro for consideration by claimants not party to the Northern Flood Agreement. The total amount paid to March 31, 1991 is $35.9 million. Manitoba Hydro is not able to precisely determine the contingent liability for submitted claims but has estimated it to be in excess of $4.0 million.

ii) Grand Rapids Project

Manitoba Hydro, in conjunction with the Province of Manitoba and the communities affected by the Grand Rapids hydroelectric development have completed a review of the impact of the project on the people of the communities. During the year a total of $21.1 million in compensation payments were provided by Manitoba Hydro to the communities of Easterville/Chemawawin and Moose Lake. Manitoba Hydro is not able to precisely determine its contingent liability with respect to the remaining communities.

c) Construction Commitments

Construction on the Limestone Generating Station has proceeded with first power provided September 8, 1990. The current forecasted cost of the new generating station is $1 451.4 million, of which costs of $1 278.8 million have been incurred to March 31, 1991.

Other outstanding commitments, principally for construction, were approximately $215.0 million (1990 - $184.7 million).

NOTE 11 – RESERVES

The following reserves are maintained by the Corporation:

Contingency and General Reserve

An amount as stipulated by The Manitoba Hydro-Electric Board may be transferred annually to this reserve. No transfers were made during 1991 or 1990.

Rate Stabilization Reserve

The net income (loss) after provision for the contingency and general reserve is transferred annually to this reserve.

NOTE 12 – SUBSEQUENT EVENTS

Subsequent to March 31, 1991, the Board of Directors of Manitoba Hydro approved a recommendation to commence funding of the Corporation's pension obligations. The initial funding of the obligations will amount to approximately $73.5 million based on the accumulated unfunded pension expense charged to operations to March 31, 1991. Thereafter annual contributions to the fund will equal each subsequent year's pension expense.

In addition to the foregoing, the Board of Directors of Manitoba Hydro approved a recommendation to consolidate the Manitoba Hydro Retirement Plan under the Manitoba Civil Service Superannuation Fund during the 1991-92 fiscal year.

FINANCIAL STATISTICS
(thousands of dollars)

	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982
STATEMENT OF OPERATIONS										
Revenues										
Residential	**254 623**	241 276	223 912	205 388	186 214	176 755	162 422	140 481	122 023	119 474
General Service and Misc.	**320 900**	305 545	291 614	259 250	227 642	223 198	205 247	180 280	155 864	158 734
Winnipeg Hydro (Cost Sharing Agreement)	**50 064**	47 469	53 564	43 707	35 415	32 984	29 826	29 398	27 180	33 146
Extraprovincial	**66 551**	60 089	31 142	66 024	113 489	112 846	103 151	105 654	105 411	72 384
Construction Power	**2 503**	2 625	1 772	0	0	0	0	0	0	0
Other Revenue	**7 858**	7 084	7 497	5 933	6 928	6 820	5 768	5 684	4 217	3 865
	702 499	664 088	609 501	580 302	569 688	552 603	506 414	461 497	414 695	387 603
Expenses										
Operating and Administrative	**253 935**	248 312	229 691	203 728	187 941	173 866	157 753	148 975	138 503	120 071
Depreciation - Plant	**92 997**	87 572	82 620	80 109	77 683	74 470	69 339	66 294	61 718	60 127
Water Rentals	**32 587**	28 855	22 867	26 220	37 582	17 850	11 287	11 760	11 575	9 342
Fuel and Power Purchased	**17 843**	33 209	59 049	35 330	10 460	9 399	14 392	9 289	8 192	16 711
Finance Expense	**256 577**	241 943	241 710	253 408	242 574	246 753	242 509	228 853	213 836	205 544
	653 939	639 891	635 937	598 795	556 240	522 338	495 280	465 171	433 824	411 795
Net Income (Loss) Transferred To (From) Reserves	**48 560**	24 197	(26 436)	(18 493)	13 448	30 265	11 134	(3 674)	(19 129)	(24 192)
BALANCE SHEET										
Assets										
Fixed Assets in Service	**4 521 947**	3 748 338	3 619 824	3 496 495	3 395 825	3 314 378	3 173 197	3 030 182	2 945 435	2 891 325
Less: Accumulated Depreciation	**1 152 873**	1 071 602	996 568	929 457	854 833	783 776	713 619	647 001	584 534	524 720
Construction in Progress	**897 865**	1 206 202	918 077	675 323	473 655	326 005	270 947	301 641	272 013	202 544
Current and Other Assets	**939 132**	811 601	844 369	589 682	225 481	272 648	193 058	249 270	251 561	156 665
	5 206 071	4 694 539	4 385 702	3 832 043	3 240 128	3 129 255	2 923 583	2 934 092	2 884 475	2 725 814
Liabilities and Reserves										
Long-Term Debt - net	**3 884 719**	3 556 626	3 341 141	3 213 030	2 652 128	2 523 786	2 213 115	2 404 657	2 367 561	2 297 887
Current and Other	**1 156 217**	1 021 338	952 183	500 199	450 693	481 610	616 874	451 082	434 887	326 771
Reserves	**165 135**	116 575	92 378	118 814	137 307	123 859	93 594	78 353	82 027	101 156
	5 206 071	4 694 539	4 385 702	3 832 043	3 240 128	3 129 255	2 923 583	2 934 092	2 884 475	2 725 814
STATEMENT OF CHANGES IN FINANCIAL POSITION										
Operating Activities										
Cash from Operations	**173 809**	141 867	79 713	61 829	96 066	107 838	83 839	65 124	48 095	41 844
Non-Cash Working Capital Increase (Decrease)	**(15 620)**	10 298	(5 445)	19 076	15 623	(5 099)	(15 013)	10 384	7 819	(5 562)
From Operating Activities	**158 189**	152 165	74 268	80 905	111 689	102 739	68 826	75 508	55 914	36 282
Financing Activities										
Proceeds from Long-Term Debt-net	**760 520**	486 529	484 140	624 245	330 713	380 014	61 002	198 234	273 963	175 393
Retirement of Long-Term Debt-net	**(396 887)**	(282 419)	(179 311)	(107 704)	(92 772)	(170 671)	(84 091)	(175 542)	(75 383)	(67 266)
Sinking Fund Payment	**(57 140)**	(54 313)	(50 350)	(45 409)	(42 055)	(39 698)	(38 755)	(37 636)	(35 514)	(33 640)
Other	**128 380**	(88 786)	141 959	(25 546)	(91 044)	(19 539)	29 868	37 944	2 563	31 782
From (To) Financing Activities	**434 873**	61 011	396 438	445 586	104 842	150 106	(31 976)	23 000	165 629	106 269
Investing Activities										
Additions to Fixed Assets	**(440 173)**	(426 922)	(380 075)	(311 009)	(237 800)	(202 039)	(122 640)	(152 283)	(128 693)	(103 954)
Other Assets	**(5 292)**	(15 347)	(12 300)	(6 096)	57	12	14	3 320	22	12
To Investing Activities	**(445 465)**	(442 269)	(392 375)	(317 105)	(237 743)	(202 027)	(122 626)	(148 963)	(128 671)	(103 942)
INCREASE (DECREASE) IN CASH	**147 597**	(229 093)	78 331	209 386	(21 212)	50 818	(85 776)	(50 455)	92 872	38 609

OPERATING STATISTICS

	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982
INTEGRATED SYSTEM – MANITOBA HYDRO AND WINNIPEG HYDRO										
Installed Winter Capability (000 kW)	4 545	4 048	4 048	4 088	4 088	4 091	4 091	4 091	4 091	4 091
Manitoba Firm Peak Demand (000 kW)*	3 586	3 631	3 407	3 356	3 011	2 941	2 952	2 889	2 543	2 735
Percentage Change	-1.2	+6.6	+1.5	+11.5	+2.4	-0.4	+2.2	+13.6	-7.0	+6.2
Energy Supplied (000 000 kW.h)										
Manitoba Hydro Generation	19 881	18 044	15 327	18 148	22 957	22 226	20 261	20 967	20 538	17 372
Winnipeg Hydro Generation	973	1 062	774	710	1 108	1 085	1 066	1 042	1 158	813
Energy Imported (Metered)										
Ontario	2	10	0	0	0	0	0	0	0	0
Saskatchewan	1 054	1 068	66	84	115	93	61	64	71	179
United States	706	1 293	2 264	1 070	0	17	20	7	43	297
Total System Supply**	22 616	21 477	18 431	20 012	24 180	23 421	21 408	22 080	21 810	18 661
Firm Energy Supplied for Manitoba Integrated System (000 000 kW.h)*	17 553	17 298	17 108	16 260	15 495	15 366	14 993	14 387	13 260	13 527
Isolated Systems Generated and Purchased (000 000 kW.h)	21	21	19	20	46	46	47	48	47	46
Total Integrated & Isolated Systems (000 000 kW.h)*	17 574	17 319	17 127	16 280	15 541	15 412	15 040	14 435	13 307	13 573
Percentage Change	+1.5	+1.1	+5.2	+4.7	+0.8	+2.5	+4.2	+8.5	-2.0	+7.9
MANITOBA HYDRO SYSTEM										
Energy Sold (000 000 kW.h)										
Residential	4 882	4 873	4 785	4 416	4 527	4 535	4 355	4 054	3 788	3 643
General Service and Misc	8 060	7 941	7 857	7 479	7 133	6 893	6 755	6 414	5 860	6 190
Construction Power	85	93	86	0	0	0	0	0	0	0
Net Transfer to Winnipeg Hydro	1 571	1 503	1 726	1 679	1 273	1 190	1 154	1 143	930	1 245
Extraprovincial (Scheduled)										
Ontario	1 721	1 796	408	1 004	817	917	795	1 153	850	1 089
Saskatchewan	14	20	114	104	10	222	233	269	231	342
United States	2 137	1 242	694	2 308	7 004	6 153	4 739	5 409	6 533	3 150
Number of Customers										
Residential	328 620	325 727	321 699	316 622	309 723	302 369	297 250	291 260	285 766	284 286
General Service and Misc	46 625	46 342	45 959	45 822	45 091	44 350	42 908	42 325	42 076	40 693
Peak Number of Employees	4 461	4 310	4 307	4 222	4 142	3 853	3 805	3 778	3 859	3 850

* Corrected for system losses applicable to extraprovincial sales

** Effective 1991, all components of total system supply represent metered values. 1990 figures have been restated to reflect the current year's presentation.

Manitoba Hydro Generating Stations and Capabilities

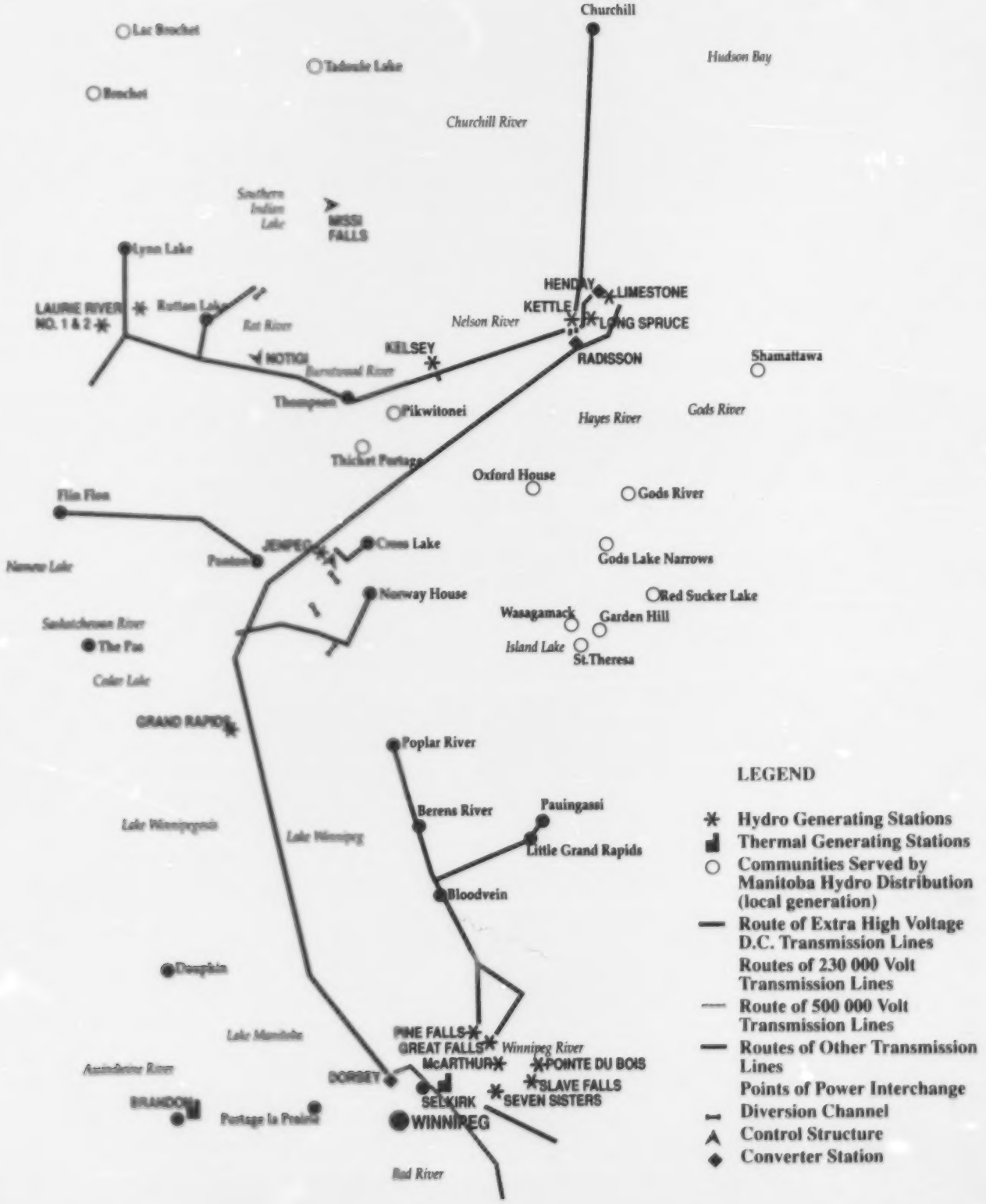
As at March 31, 1991 (Normal Winter Capability)

INTERCONNECTED CAPABILITIES

	STATION	LOCATION	No. of Units	Winter Capability in Kilowatts
HYDRAULIC:	Great Falls	Winnipeg River	6	132 000
	Seven Sisters	Winnipeg River	6	150 000
	Pine Falls	Winnipeg River	6	82 000
	McArthur	Winnipeg River	8	56 000
	Grand Rapids	Saskatchewan River	4	472 000
	Kelsey	Nelson River	7	224 000
	Kettle	Nelson River	12	1 272 000
	Jenpeg	Nelson River	6	126 000
	Long Spruce	Nelson River	10	980 000
	Limestone	Nelson River	4	532 000
	Laurie River (2)	Laurie River	3	10 000
	TOTAL HYDRAULIC			4 036 000
THERMAL:	Brandon		5	237 000
	Selkirk		2	132 000
	TOTAL THERMAL			369 000
	TOTAL			4 405 000

ISOLATED CAPABILITIES

DIESEL:	Brochet	1 175
	Garden Hill	4 165
	Gods Lake Narrows	1 575
	Gods River	525
	Lac Brochet	525
	Oxford House	1 775
	Pikwitonei	500
	Red Sucker Lake	950
	St. Theresa	2 330
	Shamattawa	825
	Tadoule Lake	700
	Thicket Portage	500
	Wasagamack	1 100
	TOTAL	16 645
TOTAL GENERATING CAPABILITY		4 421 645


Churchill
Lac Brochet
Tadoule Lake
Hudson Bay
Brochet
Churchill River
Southern Indian Lake
NISSI FALLS
Lynn Lake
HENDAY
LIMESTONE
KETTLE
LAURIE RIVER NO. 1 & 2
Rat River
Nelson River
LONG SPRUCE
KELSEY
RADISSON
Shamattawa
Burntwood River
Thompson
Pikwitonei
Hayes River
Gods River
Thicket Portage
Oxford House
Flin Flon
Gods River
JENPEG
Cross Lake
Gods Lake Narrows
Norway House
Red Sucker Lake
Wasagamack
Garden Hill
Island Lake
St.Theresa
The Pas
GRAND RAPIDS
Poplar River
Berens River
Pauingassi
Lake Winnipegosis
Lake Winnipeg
Little Grand Rapids
Bloodvein
Dauphin
PINE FALLS
GREAT FALLS
Winnipeg River
McARTHUR
POINTE DU BOIS
DORSEY
SLAVE FALLS
SELKIRK
SEVEN SISTERS
BRANDON
Portage la Prairie
WINNIPEG
Red River
LEGEND
Hydro Generating Stations
Thermal Generating Stations
Communities Served by Manitoba Hydro Distribution (local generation)
Route of Extra High Voltage D.C. Transmission Lines
Routes of 230 000 Volt Transmission Lines
Route of 500 000 Volt Transmission Lines
Routes of Other Transmission Lines
Points of Power Interchange
Diversion Channel
Control Structure
Converter Station

WHAT'S AHEAD? POWER SMART!

POWER SMART

Industry-wide standards that will encourage homebuilders and homebuyers to construct or retrofit homes that meet or exceed energy-efficient guidelines . . . high efficiency motors that are two to 10 per cent more efficient than standard motors because they reduce the loss when electricity is converted to useful work . . . energy-efficient shower-heads that reduce the flow of hot water and result in up to 30 per cent reduction in energy . . . the promotion and development of guidelines and energy-efficient ratings for major electrical appliances. All these programs reduce energy costs for the customer and reduce the demand for electricity, ultimately delaying future Manitoba Hydro capital projects.

In April 1991, Manitoba Hydro unveiled the new name for its conservation effort – Power Smart. This theme will now embrace the above programs and others already undertaken by Manitoba Hydro aimed at reducing the growth in the consumption of electricity.

With Power Smart – the leading customer-oriented energy conservation program in North America – Manitoba Hydro will be in a better position to influence manufacturers and retailers to produce and promote energy-efficient products and to improve the availability of energy-efficient appliances and energy-saving devices. As Power Smart involves most Canadian electric utilities, it will allow the utility to carry out advertising and promotion beyond the promotional budgets of utilities acting alone. It will also allow Manitoba Hydro to act in conjunction with manufacturers and government agencies to develop standards and improve energy-efficient applications through the pooling of existing knowledge and research funds. Finally, utilities under the Power Smart umbrella (seven provinces and two territories have adopted the theme) can work together and share information on effective Power Smart programs, improving customer acceptance of new technologies and techniques while minimizing the cost to administer the program by the utility.

During the next year Manitoba Hydro will be announcing several Power Smart programs as well as developing new ones. Upcoming for 1991-92 in residential and commercial programs is a rebate program or exchange program to be offered as an incentive to encourage the use of energy-efficient showerheads. The residential arm of the project is targeted to save approximately 9 000 kilowatts in demand and 43 million kilowatt hours in energy annually, with another 4 000 kilowatts and 19 million kilowatt hours in savings for commercial customers.

For large industrial customers, Power Smart high efficiency motors will be promoted as a means of saving energy costs and achieving longer motor life and improved power factor. A schedule of rebates will be offered as an incentive to both high efficiency motor vendors and purchasers. The program is targeted to reduce power consumption by 10 000 kilowatts and 50 million kilowatt hours annually.

Agricultural producers will reap the benefits of lower energy costs as well with the use of Power Smart 175 watt infra-red parabolic lamps instead of 250 watt infra-red lamps for keeping livestock warm. Currently hog operations use about 40 000 of these 250 watt heat lamps.

Through this program, 3 000 kilowatts and 16 million kilowatt hours of electricity will be conserved.

In addition, an ongoing consumer awareness program will be undertaken to increase the consciousness of energy use and to illustrate how electricity users can save with minor changes in their everyday habits.

manitoba hydro